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THE
NATURALIST:

A
MONTHLY JOURNAL OF
NATURAL HISTORY FOR THE NORTH OF ENGLAND

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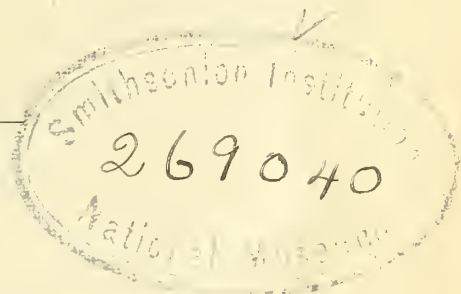
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RILEY FORTUNE, F.Z.S.

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PRINCIPALLY FOR THE NORTH OF ENGLAND.

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T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;

AND
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THE NATURALIST

FOR 1923.

NOTES AND COMMENTS.

LANCASHIRE AND CHESHIRE ENTOMOLOGY.

A recent meeting of the Lancashire and Cheshire Entomological Society was devoted to exhibits. One of the most interesting features was the wide distribution and abundance of *Colias edusa*. In the immediate neighbourhood it was reported from Hale, Formby, Chester, Tattenhall, Waverton, Mouldsworth, Point of Ayr, and Abergele. Var. *helice* was taken at Abergele and Chester. Mr. B. H. Crabtree exhibited varieties of *Chrysophanus phlæas*, including var. *schmidtii*. Mr. S. P. Doudney brought Witherslack insects, including *Xylocampa areola*, *Dasychira pudibunda*, *Pterostoma palpina*, *Abrostola triplasia*, *Drepana lacertinaria*, *Nemoria viridata*, *Scodiona fagaria*, *Acronycta menyanthidis*, *Ino geryon* and *Cænonympha typhon*; and from Bude, *Lycæna arion*. Mr. Garner Richards: a long series of *Lycæna icarus*, and *Chrysophanus phlæas* from Hale district (Lancs.).

EXHIBITS.

Mr. A. W. Hughes: *Eupithecia consignata* from Warmington, Northants., and a series of a light form of the female of *Pararge egeria* and a bred series of *Malacosoma neutria*, and some *Aromia moschata* (Coleoptera) from Freshfield. Mr. C. F. Johnson: long series of *Lycæna corydon* and *Lycæna bellargus*, including some beautiful varieties. Mr. Wm. Mansbridge: fine series of *Blastobasis lignæ* and its dark variety *adustella* and also a pale variety, from Grange. Mr. C. P. Rimmer: a series of *Abraxas grossulariata* with some dark forms from Neston, Cheshire, and one very pale form from Abergele, N.W.

VARIETIES.

Mr. S. Gordon Smith: a fine collection of varieties he had secured this year, including, from Chester, *Perenoptilota fluviata*, a bred series obtained from a specimen which came to light. *Agrotis puta*, series taken at light; *Dianthæcia carpophaga*, dark var. taken at light; *Agrotis exclamationis*, varied series at light; *Luperina testacea*, dark var. at light. From Delamere, *Anisopteryx aescularia*, var. with almost unicolorous fore-wings at light; *Diacrisia sanio*, three, including one var. with the band on the hind wings missing. *Spilosoma lubricipeda*, approaching var. *fasciata*; *Polyphoca flavicornis*, 2 vars. without the cross lines, one with the lines joined together, one with thorax and body black,

and one very pale. A specimen of *Drepana binaria*, taken at Mouldsworth; *Chrysophanus phlæas*, var. with the orange red band of hind wings missing, from Waverton. From Witherslack, *Mamestra dentina*, dark var.; *Rusina tenebrosa*, very dark specimen; series of *Pachys betularia*; *Lomaspilis marginata*, varied series taken at light.

GREENLAND.*

A delightfully refreshing volume has been written by a Past-President of the Yorkshire Naturalists' Union, and illustrated by a number of photographs and sketches, some of the latter being by Mrs. Seward. The author's object apparently was to investigate the fossil flora of the island, and as a result of his work the collections in the British Museum and the Cambridge Museum have been enriched to the extent of over a thousand valuable specimens. But, besides being a Botanist, Professor Seward is a human being, and this volume contains a charming account of the physical features of the island, and of its inhabitants.

YORKSHIRE REMINISCENCES.†

So long ago as 1893, the Rev. M. C. F. Morris wrote a Memoir relating to his father, Francis Orpen Morris, so well-known by his works on British Birds, Butterflies, and other popular subjects, which were printed at Driffield. Later he wrote a History of Nunburnholme, where he was for many years Rector, then followed a valuable volume entitled 'Yorkshire Folk-Talk,' and now we have his 'Reminiscences,' in which he states that if some of the pages appear to deal with trivialities, it must be remembered that life is of necessity largely made up of inconsiderable matters. 'Moreover, the volume is not intended for serious reading. If it proves a means of beguiling a few winter evenings or summer holiday hours it will have accomplished its object.'

CHARACTERISTICS OF YORKSHIREMEN.

The reviewer does not have much opportunity of beguiling winter evenings, and he does not have summer holiday hours when he is inclined to read books, but it does happen that recently he was confined to the house for a few days, and certainly the volume helped to beguile some hours very pleasantly indeed. The Reminiscences contain numerous stories bearing upon the characteristics of Yorkshiremen; schooldays, with the early days of railways, early religion on the Wolds, Nafferton, Nunburnholme, the Sykes Family, Tichborne Case, our Folk Speech, and numerous other sub-

* 'A Summer in Greenland,' by A. C. Seward. London: Cambridge University Press. (100 pp., 7s. net.)

† By Rev. M. C. F. Morris. London: Humphrey Milford. (360 pp., 12/6 net.)

jects, but all through the volume is very pleasantly written and will particularly appeal to Yorkshiremen. We should like to repeat some of the excellent stories which are given, but must leave our readers to enjoy the book for themselves.

WEIGHTS OF NATURALISTS.

At a recent meeting of the Linnean Society of London, Dr. A. B. Rendle exhibited a visitors' book, in use by Sir Joseph Banks, from 1778 to 1811, the weight of the visitors being noted. The book contains the names of many well-known botanists of the period and of other visitors to Banks's herbarium and library. In several cases the same person is recorded at different dates, and the variation in weight is curious and interesting. Banks was weighed 13 times, his weight increasing from 13 st. 10 lbs. to 16 st. on April 14th, 1811. The General Secretary commented on two names mentioned by Dr. Rendle as occurring in the volume: (1) Sir Charles Blagden, a noted physician and close friend of Banks, appreciated also by Dr. Samuel Johnson, whose 'Blagden, sir, is a delightful fellow,' occurs in Boswell's *Life of Johnson*; and (2) Prof. von Linné, who was Banks's guest in 1782; the Professor's weight was 12 st. 3 lbs., which shows that he was a bigger man than his father, the famous naturalist.

YORKSHIRE GEOLOGISTS.

At the Annual Meeting of the Yorkshire Geological Society, held at York recently, Mr. H. E. Wroot in presenting the Annual Report gave an outline of work still to be accomplished in the county. Mr. J. W. Sutcliffe's report as Treasurer indicated that the Society's finances were in a sound condition. Mr. J. J. Burton, J.P., was elected President of the Society for the forthcoming year, and Mr. W. P. Winter, Treasurer. The retiring President, Mr. G. W. Lamplugh, F.R.S., gave an address on the Speeton Clays, an important paper upon which he published many years ago. He referred more particularly to the recent work of foreign geologists on the Neocomian series. Mr. C. Thompson read a paper on the Modern Classification of Ammonites, which evoked a discussion.

AGE AND AREA*

This is a study in geographical distribution and origin of species, in which the author has endeavoured to free himself from the trammels of the natural selection theory, and to work as if he had found himself in another planet where scientific investigation was just beginning. The author's

* By J. C. Willis. London: Cambridge University Press, x.+259 pp. 14/- net.

point is that the area occupied by a given species is proportionate to its age. He has studied the distribution of animals and plants in various parts of the world and seems to have solicited the help of a whole army of friends in bringing forward his theories. Frankly, the book is not one which can be readily read or summarised, and will require very slow and careful perusal by the serious student who wishes to grasp the various interesting points brought forward. We wish we had the time available to read and discuss the volume, but we have no hesitation in saying that it is full of suggestions which may or may not be accepted by the student of evolution or distribution. It also contains chapters by Hugo de Vries, H. B. Guppy, Mrs. E. M. Reid, and James Small.

FULMAR PETREL.

The East Riding County Council has approved the recommendation of the Wild Birds and Eggs Protection Committee of the Yorkshire Naturalists' Union that the eggs of the Fulmar Petrel shall be protected as well as the birds, so that in future it will be possible to take proceedings against persons taking eggs of this bird in the county.

ANOTHER 'QUENNELL.'*

This work follows that relating to Palæolithic Man, by the same authors, which was reviewed in these columns recently. We like the present volume better, and certainly in the way in which the authors have given restorations of various objects relating to the period covered is most welcome, and will enable the significance of many antiquities to be grasped more easily than by perusal of the usual text-books. The view of the Flint Miners, page 13, Banks at Badbury Rings, page 31, and others are of special interest, the only really incongruous picture seems to be a gentleman in his vest and pyjamas sat gazing into a large bowl which appears to have a smaller one inside, and is labelled 'Water Clock.' Even if the object was a water clock, it is difficult to see what purpose could be served by the person sat staring at it, as much as to say 'who ever said *that* was a "water clock."'

A VALUABLE CATALOGUE.

'Catalogue of the Books, Manuscripts, Maps and Drawings in the British Museum (Natural History).' Vol. VI., Supplement A-I., 511 pp. Probably the scientific library in our National Natural History Museum is as complete as anything of its kind in the world, as indeed it should be. For some

* 'Everyday Life in the New Stone, Bronze, and Early Iron Ages,' by Marjorie & C. H. B. Quennell. London: B. T. Batsford, Ltd., x.+119 pp., 5/- net.

time the five large quarto volumes comprising the catalogue of this library have been invaluable for reference, and have been exceedingly useful to the scientific world in an enormous number of directions. When it is borne in mind that the present supplement consists of over 500 pages of closely printed titles, in double columns, it will be understood that this is a work of more than usual importance. The Trustees of the British Museum are to be congratulated on the publication, in these times, of so fine a volume. The only improvement which we can suggest is that it should be issued in a more suitable cover than one of paper. As a Supplement is Addenda and Corrigenda, Vols. 1-2, A. Hooker, 48 pp., which will keep some of our Librarians occupied if the matters recorded are properly attended to !

MAN AS A GEOLOGICAL AGENT.*

Dr. Sherlock has produced a volume on a subject which he has made peculiarly his own, and we must admit that while, of course, being aware of the changes wrought by man in the way of quarrying, excavating for railway cuttings, etc., we were not prepared for the startling details and statistics which Dr. Sherlock's researches have produced. Man has evidently much more effectively changed the face of this country than most people are aware. The illustrations to the volume have been well selected, and represent changes of infinite variety, from the 200 feet-high tip-heap of Molten Slag near Middlesbrough, and the Mountains of Burnt Shale near Edinburgh, to the artificial changes in river courses, and areas taken by man for water supply; a map of part of the Pennines upon which such areas are indicated is quite astonishing. On account of the great length of time during which the British Islands have been occupied by man, as compared with some areas of the globe, these islands probably produce illustrations of artificial changes of a more forcible character than can most other countries, hence Dr. Sherlock has a good field for his studies. The variety of subjects dealt with may be gathered from the titles of his chapters which deal with Denudation, Excavations, Attrition, Subsidence, London, Accumulation, Alteration of the Sea-Coast, the Circulation of Water, Climate and Scenery, Conclusions. The whole volume is a well reasoned account of man's efforts in changing the country in which he lives, and we must congratulate Dr. Sherlock upon the extraordinary collection of examples which he has got together, and upon the way in which he has secured statistics from sources which many workers know not of.

* By R. L. Sherlock. London : H. F. & G. Witherby., 372 pp., 20/- net.

THE WIRRAL PENINSULA.*

We have in these columns frequently referred to Mr. Hewitt's excellent work in the Liverpool district, and the present volume may be taken as a type of the Regional Survey which is now being taken up so enthusiastically by committees of workers in various districts, though so far as the Wirral is concerned, Mr. Hewitt seems to have accomplished the survey very largely single-handed. He deals with the Peninsula Area : Maps and Photographs ; The Land Surface : Orography and Geology ; The Coast ; The Estuaries, Tidal Waters, and Sandbanks ; The Stream System ; Springs, Wells and Water Supply ; Climate and Weather ; Vegetation ; Animal Life ; Prehistoric Times ; Historical Record ; Towns and Villages ; Population and Local Government ; Communications, Agriculture ; Industries ; Schools and Churches, etc. He reproduces old maps showing changes in the district. There are diagrams to illustrate parishes, contours, canals, etc., as well as reproductions of Speed's and Greenwood's well-known maps. Those interested in the education of children and adults will find much of service in Mr. Hewitt's book.

ENGLISH COASTAL EVOLUTION.†

In this case the author does not make any pretence to discuss the evolution of coast lines, but rather makes an attempt to consider the coast of England and Wales in the light of the theories on coastal development already expounded by Prof. W. M. Davis, Prof. D. W. Johnson and M. Emm. de Martonne. After a general consideration of the coast line of the country, erosion, shore deposition, etc., the author deals principally with South-western and Southern coasts and those of Wales ; though Norfolk, Yorkshire and Lincolnshire are touched upon. Naturally we turn to that part dealing with Yorkshire, which is frankly disappointing, though we must admit it is obviously not so familiar an area to the author as are the others. Few districts have received so much attention in recent years from the point of view of coast changes as that of the Humber district, and books and papers innumerable have been issued dealing with its various aspects, but these seem to be unknown to the author, even Clement Reil's Holderness not being mentioned in the 'Bibliography,' and the only item credited to the present reviewer is a paper in the *Geographical Journal* which is said to be by T. Shephard.

VARIETIES OF BRITISH LEPIDOPTERA.

Mr. S. L. Mosley, Curator of the Tolson Museum, Hudders-

* An Outline Regional Survey, by W. Hewitt. London : Hodder & Stoughton, Ltd., ix.+299 pp., 7/6 net.

† By E. M. Ward. London : Methuen & Co., x.+262 pp., 8/6 net.

field, is publishing a second edition of his 'Varieties of British Lepidoptera,' the first edition of which was issued in 1874-5, and has long been out of print. The first part of the new edition is before us, and contains seven plates of exquisitely drawn and hand-painted figures of *Papilio machaon*, *Goncpteryx rhamni* and *Colias hyale*, with explanatory notes. The part differs from the original edition in that the plates are loose; and for the most part only one side of the insect is figured, thus enabling the author to give more figures on a plate. There are also, of course, many figures which did not appear in the old edition. The original edition contained about 300 figures of varieties, but in the Prospectus of the new edition, the author tells us he has now over 1700 figures to draw upon. He states that each part will contain six plates containing about 50 figures, and he hopes to issue one part per month. He also requests that any lepidopterist having striking varieties will lend them to him for figuring in the work.—G.T.P.

CEYLON FUNGI.

We are pleased to receive substantial evidence of continued activities on the part of our contributor, Mr. T. Petch, of the Botanic Gardens, Peradeniya. On looking at the pile of literature which has been produced from this well-known Botanical sanctuary since Mr. Petch's appointment there some years ago, it is certainly a matter for congratulation that Ceylon has had this East Yorkshire botanist in its midst. Among the memoirs just received are from the 'Annals of Botany': *Mocharas* and the Genus *Haematomyces*; from 'Indian Botany': *Lantana* in Ceylon; and from the 'Royal Botanic Gardens, Peradeniya': *Saccolabium longifolium* and *Saccolabium wightianum*; Additions to Ceylon Fungi; Recent Revisions of Ceylon Botany: *Hypocreaceæ zeylandicæ*.

A RELIABLE ATLAS.*

We must congratulate the Ordnance Survey on the way in which its work has been recently made to appeal to a much larger public than was formerly possible. The Director of the Ordnance Survey has certainly done much to popularise the maps issued in this department, and in the present volume the various sheets are brought together, mounted on linen, and by the aid of a key the map of any particular part of the country can readily be consulted. When opened, the maps measure 28 in. by 10 in., an average strip, for example, includes Flamborough and Spurn on the East, and Settle and Rochdale

* 'Ordnance Survey Atlas of England and Wales.' Quarter inch to the mile. Printed at the Ordnance Survey Office, Southampton, 30/- net.

on the west ; another, from Lowestoft and Ipswich on the east, and Kettering and Bishop Pagnel on the west. The maps are very carefully coloured, the contours on both land and sea being most distinctly marked, in addition to which the heights are tinted in various shades, which give a ready view of the appearance of any particular part of the country. The main roads, railways, canals, and other features likely to be required by the traveller are marked with a clearness which is certainly refreshing. We have nothing but praise for this, the latest product of the Ordnance Survey Department.

SOUTH-WEST YORKSHIRE ENTOMOLOGICAL SOCIETY.

The First Annual Exhibition Meeting of this Society was held at Shelley on Nov. 18th, Mr. B. Morley, President, in the chair. The President read a paper on 'Colour Development in Lepidoptera,' suggesting that fuscous and ochreous were the primitive colours in this order, which he considered to be derived directly from the Trichoptera. Melanism might be regarded as a reversion to ancestral coloration. This view was criticised by Messrs. Porritt, Lodge and Smart. Mr. W. Buckley exhibited long and varied series of *Hybernia defoliaria* and *H. aurantiaria* from Clayton West. Mr. E. Cocker, aberrations of *Arctia caja* from Huddersfield (1) with fore-wings mostly brown, (2) with orange hind wings, (3) suffused throughout with smoke colour, (4) heavily marked with black. Mr. T. H. Fisher : aberrations of *H. defoliaria* from Bretton. Mr. D. Harrison : a series of *Bombycia viminalis* var. *obscura* ; aberrations of *Ematurga atomeria*, including a gynandromorphic specimen ; aberrations of *Agrotis fimbria*, *A. primulae*, *Xanthia lutea*, *X. fulvago*, *Larentia galiata*, *H. leucophaeria* and *A. caja*, all from Huddersfield. Mr. L. Hooper : aberrations of *Rumicia phlaeas*, *Amorpha populi*, *Hadena monoglypha*, *Orthosia helwola*, *Miselia oxyacanthae*, *Abraxas grossulariata* (including ab. *odersfeltia*), all from Middlestown, and a dark brown *Macrothylacia rubi* ♀. Mr. A. Kaye, *A. grossulariata*, abs. *nigro-sparsata*, *lunulata* and *lutea*, from Huddersfield. Mr. B. Morley : series of the tortricid genera *Acalla*, *Pandemis*, *Tortrix*, *Cnephasia* and *Exapate*. Mr. G. T. Porritt : *Spilosoma mendica* var. *venosa*, Tyrone ; *A. grossulariata* abs. *albo-varleyata* and *lutea-varleyata*, from selective pairings ; *Larentia fluctuata* ab. *incanata*, Huddersfield. Mr. H. Spencer : series of *Pyrallidae* and *Tortricidae* from Elland, including *Cacoecia costana*, *Olethreutes nigricostana* and *Grapholitha aurana*.—H.D.S.

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British Birds for November contains notes on Icterine Warbler, and East Woodhay Warbler, as well as many shorter items.

H. Cartwright writes on 'The Association and Non-Association of *H. nemoralis* and *H. hortensis*,' in *The Journal of Conchology* for October.

YORKSHIRE MYCOLOGISTS AT BUCKDEN.

A. E. PECK.

THE Fungus Foray of 1922 (the 303rd Meeting of the Yorkshire Naturalists' Union), was held at Buckden, Upper Wharfedale, from September 30th to October 6th.

Members of the Mycological Committee present were: Harold Wager, D.Sc., F.R.S., Chairman; W. N. Cheesman, J.P.; Alfred Clarke; F. A. Mason; Thomas Smith; J. Ackroyd; R. Fowler Jones; Greevz Fysher; Miss D. Hilary, and A. E. Peck, Hon. Sec. The following members of the Union and friends were also present: H. B. Booth, W. B. Haley, Percival Ross, Mrs., Miss H., and Mr. Percy Fysher, Mrs. Smith, Mrs. Peck, Miss Allison and Miss Hewlett.



Photo by]

[A. E. Peck.

P. Ross, Mrs. Smith, Mrs. Fysher, Miss Fisher, H. B. Booth, Mrs. Peck.
Greevz Fysher, W. N. Cheesman, H. Wager, A. Clarke, T. Smith.
R. Fowler Jones, W. B. Haley.

Headquarters were at the Buck Inn. For an account of the Mycological Meeting held at Buckden in 1916, see *The Naturalist* for March and April, 1917.

The Vicar of Hubberholme, the Rev. J. B. M. Chaplin, kindly placed the Village Schoolroom at our disposal for the purpose of a public lecture, and otherwise manifested his interest in the proceedings.

The summer of 1922 will long be remembered as one of almost continuous wet weather with low temperatures, a most trying and difficult time for the Agriculturist, and anything but encouraging for the Field Naturalist. These conditions were probably responsible for the poor show of Fungi now experienced, whereas in a good season a prolific display may confidently be relied upon. A visit a few weeks earlier would probably have met with a better reward. Dr. Wager had visited the woods in the month of August, and from them and the district of

Hawswick and Littondale had recorded about 100 species, some of which were new to the county. He also reports the rather common occurrence of the Morel (*Morchella esculenta*), near the banks of the river in the springtime.

The woods in the vicinity of Buckden are full of interesting trees, all of which have been planted within the last hundred years. For the larger Polypores, which are usually associated with trees of ancient growth, the district is of little interest. *Polyporus betulinus*, almost always present where grows its host, was found sparingly on the decaying and fallen trunks and branches of Birch. Oak trees are rare.

An agaric found in fair numbers, which was a stranger to most members, proved to be *Tricholoma cerinum*. Another gratifying discovery was *Pholiota flammans*, with yellow gills, although the spores borne upon them are brown. This species was found rather abundantly at Keswick at this year's meeting of the British Mycological Society, but it is said to be rare in the South of England. *Pluteolus aleuriatus* presented unfamiliar features, and its determination gave satisfaction. In the pastures, particularly those of the uplands, *Hygrophorus laetus* and *Lepiota carcharias* were in evidence everywhere. They were found right up to the top of Buckden Pike, 2303 feet above sea-level. *L. carcharias* was never seen during the visit of 1916.

Also on high ground *Anellaria separata* was discovered on cow-dung. This is its usual host in the mountain pastures of Switzerland (vide Somerville Hastings), and although, in this country it is commonly found on horse-dung, it is very frequent on the host referred to on the Yorkshire hills.

Another notable find was *Tremella encephala* (Willd.) Quél., (= *Naematelia encephala* (Willd.) Fr.). The Tremellas are gelatinous fungi usually growing on wood. The species under notice possesses a firm, hard, and white nucleus, a feature observed by Mr. Cheesman, which led to its identification.

Neither the common Field Mushroom nor the 'Horse Mushroom' were seen during the Foray, although common in the district, and the only dish of edible fungi eaten was supplied by *Clitocybe nebularis*.

An interesting Fungus which grows in Upper Wharfedale, however, still awaits satisfactory determination, although specimens have been abundant at two Yorkshire Naturalist Union Fungus Forays.

In 1916, Messrs. Massee and Clarke gathered in one field specimens which Massee declared to be the autumn form of *Tricholoma gambosum* (the Saint George's Mushroom which grows in spring and early summer). This determination did not commend itself to the majority of members present, though, after repeated efforts, they had to admit that they could not offer a satisfactory alternative solution. Massee did not withdraw his opinion, and no record was made. Members had this incident well established in their memories upon the occasion of the present visit, and were anxious to clear up the question.

Mr. A. Clarke and the present writer therefore made an early pilgrimage to the field which had produced the interesting specimens of 1916, Mr. Clarke readily identifying the field which he had visited with Massee. It is about a mile from Buckden on the left of the road to Aysgarth, and slopes from the road to the stream. Investigation soon showed that the fungus sought for was present in good numbers, and ample material for investigation was soon gathered (two single specimens were later found on the other side of the Wharfe above the wood). The specimens came repeatedly under examination by members, but at the conclusion of the meeting, this 'Mycological puzzle' remained unsolved. The specimens have some affinities with *Tricholoma paneolum* Fr., but inasmuch as the gills are easily separable from the underlying cartilagenous layer as is the case in the genus *Paxillus*, an affinity with the genus named is very apparent. The gills are sinuate, the spores distinctly white,

and the odour pleasantly sweet, but well distinguished from that of *Tricholoma gambosum*. Members were unanimous in rejecting the 'Autumn form' theory, however, and in this are supported by Mr. Carleton Rea, who writes:—'I certainly cannot assent to the idea that a species can have one form when it occurs in the spring and another when it occurs in the autumn, and can only suppose that we have two distinct species to deal with, although each gathering may be obtained from exactly the same spot. From your description I should think you have a *Paxillus* to deal with, but I shall be very pleased to see your specimens when you collect them next autumn.'

The usual evening meetings, discussions and lectures were held. At the business meeting all officers were re-elected. Mr. Cheesman led off with a discourse upon the Mycetozoa. Illustrative diagrams lined the walls of the room.

The recently published 'British Basidiomycetae,' a Handbook to the Larger British Fungi, by Carleton Rea, B.C.L., M.A., formed the subject of a discussion.

Dr. Wager gave a lecture to the Committee on 'The Action of Gravity on Fungi.' He described experiments to show that the stipes of the Agaricaceae respond to gravity as to a stimulus, and that a curvature takes place which is brought about by differential growth on the lower and upper sides of the stipe when this is placed in a horizontal position. The possible explanations of this phenomenon were fully discussed, and from experiments which had been made, the evidence was clear that the sensitive region for the gravitational stimulus is in the apical region of the stipe and not in the pileus. The gills, however, have a separate response of their own.

Dr. Wager also gave a public lecture in the Schoolroom on 'Toadstools and their Ways.' The Vicar of Hubberholme was in the chair and very cordially welcomed the members of the Committee to Buckden. The lecturer dealt with the general structure, mode of life, and reproduction of the commoner Fungi. He showed how well the spores were protected when young, and described the beautiful method of spore dispersal by which millions of spores from a single specimen are thrown off into the air in the course of a few days. Some of the principal types of the larger Fungi were exhibited, and the general principles of classification were dealt with.

Following upon Dr. Wager's Lecture, the writer spoke briefly upon the edible qualities of various species of fungi, illustrating his remarks by specimens gathered in the district. This was intended to be for the benefit of the villagers present.

As usual, a packet of resupinate species was despatched to Miss E. M. Wakefield, of Kew Herbarium, for determination; and one of these, *Stereum Karstenii*, proves to be a new record for Britain.

Likewise numbers of *Pyrenomycetes* were forwarded to Sir Henry C. Hawley, who has kindly named them. Mr. F. A. Mason dealt with the Discomycetes, the Uredinaceæ, and the Sphaerioidaceæ.

Mr. F. A. Mason exhibited a new 'Graphic Key to the Genera of the British Agaricaceae,' of which he is the author. It is claimed that by reference to this 'Key' (which occupies one sheet only) any agaric (toadstool) may be at once relegated to the genus to which it belongs, thereby solving a difficulty that is a very real one to botanical students. At the request of Mr. Mason a number of tests was suggested by members, and in each case the author was able to demonstrate the efficiency and accuracy of his 'Key.' He was thanked and congratulated upon his achievement.

Mr. Mason also exhibited a map of Yorkshire showing the areas where Mycologists had been busiest. The places at which 'Forays' had been held, and the areas worked by individual Mycologists were duly marked.

Species previously recorded for this district are excluded from the following list :—

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| ** <i>Lepiota carcharias</i> (Pers.) | ‡ <i>Panaeolus caliginosus</i> (Junh.) Fr. |
| ‡ <i>Tricholoma cerinum</i> | ** <i>Polyporus chioneus</i> Fr. |
| ** <i>T. brevipes</i> | ** <i>P. caesius</i> (Schrad.) Fr. |
| ** <i>Clitocybe nebularis</i> | ‡ <i>Daedalea vermiculare</i> Pers. |
| ‡ <i>C. obbata</i> Fr. | ‡ <i>Tremella foliacea</i> |
| ** <i>C. rivulosa</i> (Pers.) Fr. | ** <i>T. encephala</i> (Willd.) Quél.
(= <i>Naematelia encephala</i> (Willd.) Fr.) |
| ** <i>Russula alutacea</i> Fr. | ** <i>Exidia albida</i> . |
| ** <i>Mycena leptcephala</i> Pers. | |
| ‡ <i>M. discopus</i> | RESUPINATE FUNGI (Certe., E. M. Wakefield, M.A., F.L.S.) |
| ‡ <i>M. flavipes</i> | * <i>Stereum Karstenii</i> Bres. |
| ** <i>M. peliculosa</i> | ‡ <i>Peniophora gigantea</i> (Berk.) Mass. |
| ‡ <i>M. debilis</i> Fr. | ** <i>P. quercina</i> (Pers.) Cke. |
| ** <i>M. capillaris</i> | ** <i>Corticium laeve</i> |
| ‡ <i>M. lineata</i> (Bull.) Fr. | |
| ‡ <i>Omphalia stellata</i> Fr. | DISCOMYCETES |
| ‡ <i>O. hepatica</i> Fr. | (Certe., F. A. Mason). |
| ‡ <i>Marasmius plancus</i> Fr. | ** <i>Helotium virgultorum</i> var. <i>fructigenum</i> |
| ** <i>Hygrophorus nitratus</i> (Pers.) | ** <i>H. citrinum</i> |
| ** <i>H. hypothejus</i> Fr. | ‡ <i>H. subtile</i> (Fr.) on decaying leaves of Conifers. |
| ** <i>H. unguinosus</i> | ** <i>Dasyscypha ciliaris</i> (Schrad.) Sacc. |
| ** <i>H. eburneus</i> (Bull.) | |
| ** <i>H. calyptraeformis</i> | PYRENOMYCETES |
| ‡ <i>Pleurotus chrysopheus</i> (Schæff.) Fr. | (Certe., Sir H. C. Hawley, Bart.) |
| ‡ <i>Lenzites saepiaria</i> Fr. | ** <i>Hypoxylon multifforme</i> Fr. |
| ‡ <i>Lentinus flabelliformis</i> (Schaeff.) | ‡ <i>H. coccineum</i> Bull. |
| ** <i>Nolanea papillata</i> | ** <i>Eutypa flavo-virens</i> (Hoffm.) Tul. |
| ‡ <i>N. infula</i> Fr. | |
| ** <i>N. pisciodora</i> (Ces.) Fr. | UREDINACEAE |
| ‡ <i>Pholiotia mycenoides</i> Fr. | (Certe., F. A. Mason). |
| ‡ <i>Hebeloma mussum</i> Fr. | ** <i>Uromyces Rumicis</i> (Schum.) Wint. |
| ** <i>Pleuteolus aleuriatus</i> Fr. | SPHAERIOIDACEAE |
| ‡ <i>Crepidotus nidulans</i> (Pers.) Quél. | (Certe., F. A. Mason). |
| ‡ <i>Hypholoma elaeodes</i> (Bull.) | ‡ <i>Septoria Hederae</i> Desm. |
| ** <i>Cortinari</i> (Derm) <i>lepidopus</i> Cke. | |
| ‡ <i>C. (Derm) anomalus</i> Fr. | |
| ** <i>Gomphidius viscidus</i> | |
| ‡ <i>Psilocybe semilanceata</i> var. <i>caerulescens</i> Cke. | |
| ‡ <i>Psathyra glareosa</i> B. & Br. | |

Mr. Cheesman collected 32 species of Mycetoza, of which the following are new to Buckden :—

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| ** <i>Didymium nigripes</i> Duby. | ** <i>Trichia persimilis</i> Karst. |
| ** <i>D. melanosporum</i> (Pers.) | |

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Among the contents of the *Annual Report of the Manchester Microscopical Society*, recently received, we notice 'Cleaning and Preparing Diatoms,' by H. R. S. Williams; 'Variations in the Nuclear Constitution of Plants,' by Prof. F. E. Weiss; 'Methods used in Animal Histology,' by G. A. McKechnie.

*=New to Britain; †=New to Yorkshire; ‡=New to Yorks. M.W.
**=New to Buckden.

YORKSHIRE NATURALISTS' UNION : ENTOMOLOGICAL SECTION.

ON October 28th, 1922, the Entomological Section held its Annual Meeting in Leeds. Mr. George T. Porritt, presided over two well attended meetings. Supplementary to the lepidoptera report submitted, the following interesting additional occurrences were reported :—*Acherontia atropos* near Halifax, Mr. D. Harrison ; *Sphinx convolvuli* near Bradford, Mr. J. Beanland, and Bridlington, Mr. W. D. Hincks. At Patrington, near Hull, in September, Mr. T. Ashton Lofthouse saw *Pararge megaera* commonly, and *Colias croceus* was seen at Beverley by a member of the British Association.

The exhibits were :—

Lepidoptera.—By Mr. Porritt :—A series of very dark *Xanthorhœ fluctuata* var. *incanata*, Huddersfield ; *Diacrisia mendica* var. *venosa*, Tyrone ; *Abraxas grossulariata* vars. *albo-varleyata* and *lutea-varleyata*, with other beautiful variations of this interesting species, all bred by the late Hon. H. Onslow. By Mr. D. H. Harrison :—A specimen of *Bupalus atomarius* with the right antenna and wings male, and the left female, from Lindley Moor, Huddersfield. By Mr. T. H. Fisher :—*Chlidonia baumanniana*, *Scoparia angustea* and *Phalonia badiana* from Skelmanthorpe. By Mr. B. Morley :—Series of a few common species showing great variation, specimens of *Cerostoma alpella*, *Acompsia flavifrontella* ; and a long series of *Agrotis agathina*, showing the ordinary pink form from the New Forest in contrast with the colour of the local race, the series of the local race having been taken in 1908, 1914, 1915 and 1922. Those taken in the first year are black with prominent pink markings, while those last taken show only slightly pink in some specimens, and in others the pink is entirely replaced by black and smoky grey. The local specimens were all taken from one small heath, and show that a decided transition in colour has taken place during the fourteen years. By Mr. Rosse Butterfield :—A large series of *Apocheima pedaria* from Keighley, showing that the species there is largely melanic. By Mr. W. Buckley :—A series of fine dark *Polia protea* and specimen of *P. aprilina*, black, with the stigmata and the transverse lines bronze green and white, a most striking insect, all from Skelmanthorpe. By Dr. H. D. Smart :—A male *Colias croceus* from Allerthorpe Common, on behalf of Mr. W. J. Fordham. A male, *Pieris napi* from Ireland, having prominal portion of vein 3 right hindwing absent and corresponding green veining also absent ; heavily and lightly spotted forms also from Ireland. A series each of *Euchlœ cardamines* and *Argynnis euphrosyne* showing minor variation, and a variable series of *Melitaea aurinia* from various British localities and the var. *iberica* from Algiers. *Melanargia galatea*, a normal British series, light forms from north France, dark forms from Switzerland, and var. *procida* from Tyrol. *Epinephele tithonus* showing variation in colour and ocellation. *E. jurtina* variation in extent and colour of bands from British localities, and var. *hispulla* from Gibraltar. A greyish ochreous female *Clisiocampa neustria* without bands. *Dilina tiliae* colour variations and one-spotted forms from various localities. *Abraxas grossulariata* minor aberrations, and *Lycaena icarus* ab. *icarinus* from Scarborough.

Coleoptera.—By Mr. J. M. Brown :—*Stenochonis meridianus*, *Leptura cerambyciformis*, *Liopus nebulosus*, *Strangalia armata* from Sheffield ; *Stenostola ferrea* and *Tetropium gabriella* from North Derbyshire. By Mr. T. H. Fisher :—*Aphodius lapponum* and *A. depressus* from Skelmanthorpe. By Mr. E. G. Bayford :—*Lyctus linearis*, *Necrobia rufipes* and *Blaps gages* from Barnsley. By Mr. W. D. Hincks :—amongst others, specimens of *Doretomus tortrix* and *Naicedes melanea*, new to Vice-County 64. Mr. Kitchen and Mr. Caird each showed a number of beetles taken in the neighbourhood of Leeds. By Mr. M. L. Thompson :

—*Quedius talparum*, Great Ayton ; *Bembidium doris* and *Myllane dubia* from Askham Bog.

Diptera.—A large case showing most of the known Yorkshire *Syrphidae* by Mr. Rosse Butterfield. By Mr. Chris A. Cheetham :—*Tipula marmorata* Mg., *T. anonyma* Bergr., and *T. signata* Staeg., *Molophilus corniger* de Mey., *Ptychoptera longicauda* Tonn., the two last being new to the British list. Mr. Winter of Shipley described an interesting observation he had made on the oviposition by a female *Syrphus*. The fly, he said, very deliberately chose nettle leaves crowded by aphides in preference to all others in which to place the egg, and that a different colony of aphides was selected for each egg. Mr. Winter also showed specimens of spiders received from Borneo, and explained their relationships with British species.

Hymenoptera exhibits were as follows : By Mr. E. G. Bayford :—♂♂ of *Sirex gigas*, *S. noctilio* and *S. juvencus* from the Barnsley district, and *Biorhiza pallida* from Bretton West. By Mr. A. E. Bradley :—A specimen of *Passalococcus monilicornis*, banded and unbanded forms of ♂♂, ♀♀, and neuters of *Bombus pratorum* ; a specimen *Psithyrus quadricola* entirely black, a form hitherto believed unknown, and a number of other bees showing interesting variations. Out of the twenty three British Bombi, Mr. Bradley said he had now taken twenty species at Roundhay, near Leeds.

Hemiptera.—Mr. J. M. Brown showed the following new or rare Yorkshire species :—*Calocoris striatus*, *lineolatus*, *alpestris*, and *infuscus*, *Coreus denticulatus*, *Pantilius tunicatus*, *Macrotylus solitarius*, *M. paykulli*, *Harpocera thoracica*, *Teratocoris saundersi*, *Nabis limbatus*. A male of the rare macropterous form *Phylus coryli* var. *avallanae*, *atractotomus magnicornis*, *Byrsoptera rufifrons*, *Lygus pastinacea*, *L. rubricatus*, *Derephysia foliacea* and *Tricephora vulnerata*.

Galls.—Mr. W. Falconer passed round many kinds of plant bearing galls, the most interesting being an *Erineum* on hawthorn, undescribed. *Oligotrophus corni* Gir., Dalton Lane, Wothersome, new to the north of England. *Perrisia trachelii* Wacht., Slaithwaite ; *P. inclusa* Frnfl., Askham Bog ; *Stictodiplosis scrophulariae* K. and larvæ, Lister Park, Bradford ; *Rhodites spinosissimae* Gir., Wothersome ; *Eriophytes tuberculatus* Nal., Mirfield ; *E. pilosellae* Nal., Slaithwaite ; *E. tiliarius* Con., Cannon Hall, new to Yorkshire. Other galls included *Andricus testaceipes* Htg., *Asphondylia meyeri* Lieb. and fly, *Perrisia affinis* Keiff., two forms, Huddersfield, *P. serotina* Winn., Kirkburton. *Eriophyes gibbosus* Nal. Honley, and a gall on moss *Chrysanthemum giganteum* found by Mr. Burrell. Mr. Laid of York showed a few gall-flies also, which included *Metastigmus stigmatizans* new to the county list.

Mr. Porritt showed a series of hand-painted figures of butterfly varieties beautifully done by Mr. S. L. Mosley, curator of the Huddersfield Museum. It was decided by the members that field meetings be arranged for Saturdays about mid-June and mid-August at Skipwith Common and Grassington respectively. Most of the officers and members of the various Committees were re-elected.—B. MORLEY, *Hon. Sec.*

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No. 64 of *The Geographical Teacher*, among many memoirs, contains 'The Displacements of Continents: The Wegener Theory,' by J. R. Platt, and an Interesting list of Forges in England and Wales, c. 1750,' by S. Herbert, from which latter we gather that at the date named there were three forges in Cheshire, four in Derbyshire, three in Durham, six in Lancashire, four in Nottingham, one in Northumberland, and eight in Yorkshire. The illustration of Cultivation Terraces, Anaga Mountains, on Plate XIII. in this publication, forcibly calls to mind the features usually known as Ancient Cultivation Terraces which occur at different parts of the Yorkshire Wolds.

VERTEBRATE ZOOLOGY IN YORKSHIRE.

A MEETING of the Vertebrate Section of the Yorkshire Naturalists' Union was held in the library of the Leeds Philosophical Society on Saturday, October 28th, Mr. S. H. Smith presiding. It was preceded by a meeting of the Yorkshire Wild Birds and Eggs Protection Acts Committee and of the Yorkshire Mammals, Amphibians, Reptiles and Fishes Committee, the chair being occupied by Mr. W. H. St. Quintin in the former case, and by Mr. C. F. Procter in the latter.

The following recommendation was brought before the Sectional Meeting of the Yorkshire Wild Bird and Eggs Protection Acts Committee, and approved :—' that the East Riding County Council be requested to pass such measures as will protect the eggs and young of the Fulmar Petrel for a period of five years.' *

Mr. C. F. Procter was elected president of the Section in place of Mr. S. H. Smith.

A paper entitled ' Field Notes ' was given by Mr. W. H. Parkin, who brought up for discussion several highly controversial subjects.

The author had given much attention to the Marsh Tit and the Willow Tit, and drew attention to the very slight differences in plumage between the two species. The most recent description of the Willow Tit† read as follows :—' Like adult British Marsh Tit, but whole crown always dull black, not glossy ; sides of neck usually more buff (sometimes pink buff), flanks and under tail-coverts varying in shade but always deeper buff—sometimes pinkish-buff, and this is a very clearly marked difference.'

These differences were very slight, he thought, and attention should be given to the nesting of the two species, as the Willow Tit is supposed to make its own nesting hole in rotten wood, while the Marsh Tit uses an existing hole. Probably the Willow Tit was the best represented in the county, but the matter had not been very thoroughly investigated.

The lecturer said that much had been written about the Cuckoo in recent years, and that according to certain south country naturalists, Cuckoos laid an enormous number of eggs in a season. In the north, he thought, they were not so prolific, though no doubt there was a good deal of individual variation. He was of opinion that a Cuckoo will visit from time to time the nests in which her eggs have been placed. Several other species, including the Missel Thrush and Nuthatch, were dealt with and an interesting discussion followed.

Mr. H. B. Booth next gave a paper on ' The Changing Status of the Tern Colonies in the Farne Islands.' These local migrations were first recorded a year ago by Mr. Riley Fortune, and reported in *The Naturalist* for January, 1922, page 22. Since then the Tern Colonies have left the Brownsman and spread up and down the coastline, and the lecturer thought that the herring shoals were further out to sea than usual, and that the Terns had followed their main food supply as far as they could in migrating to the Brownsman, and finding this useless, had scattered. The Terns at Spurn appeared to have suffered similarly. The lecturer drew attention to the report of the Farne Islands Association for 1919, in which the nesting of the Fulmar Petrel in the Farne Islands was recorded. Several members who visited the Farne Islands in that year are confident that the Fulmars did not nest, and it is hoped that by giving this publicity the spread of an incorrect record will be prevented. Mr. R. Fortune thought that the Terns in leaving the Farne Islands had been governed to a great extent by food supply, and that the colonies would return when things were once more normal. This was not the

* This recommendation has since been adopted.—Ed.

† A Handbook of British Birds, by Witherby.

first time that the Terns had abandoned the Farne Islands. He, however, was afraid that the overrunning of the nesting grounds by the public during the last season or two, was bound to have a very bad effect upon the colonies, and unless steps were taken to prevent this, it would probably cause the Terns to forsake the islands entirely.

'Notes on Bird Life,' illustrated by the lecturer's own photographs, were given by Mr. T. M. Fowler. Photographs of the Long Eared Owl were shown, the nest in one case being on the open ground. The eggs were laid at an average interval of two days, and on one occasion the nest contained the intact remains of two Sparrows, two Greenfinches, two Chaffinches, one Robin and one Willow Warbler. Several beautiful slides were shown of the Water Rail: these the lecturer secured in a reed bed in Norfolk. In order to clear the field of view for photographic purposes the reeds had to be cut, and this the birds at once commenced to rectify by building up the front of the nest until the sitting bird was quite concealed from view. The Nuthatch was next dealt with, and photographs shown of the bird at its nesting hole, about 22 feet from the ground. Several nests were found, but in no case had the birds reduced the size of the nesting hole by plastering it up, as is commonly the case. Finally, photographs were shown of the Gannet Colony on the Bass Rock.

Mr. C. F. Procter gave a paper entitled 'Early Man,' in which the lecturer traced man's evolution from the earliest known times, and showed photographs of numerous remains and restorations. Man is geologically of very recent origin, and contemporary with only the most recent of the extinct animals. He had changed little in his physical characteristics since the period of the earliest remains yet discovered, and the main changes were in erect posture, the suppression of the eye-brow ridges and the greater development of the forehead and chin. The early skulls and jaw bones were, comparatively speaking, very massive.

The lecturer traced man's evolution from *Pithecanthropus erectus*, and dealt with Heidelberg, Galley Hill, Neanderthal, Cro-Magnon and Neolithic types, pointing out the characteristics and the conditions under which they had lived.

In conclusion a vote of thanks to the lecturers and to the lanternist was proposed and carried unanimously.—E. WILFRED TAYLOR.

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The editor, Mr. F. Morey, has produced Part 2 of the *Proceedings of the Isle of Wight Natural History Society* (pp. 53-97, 1/6) close upon the heels of Part 1. There is a lengthy account of the Society's excursions and meetings, with lists of the more important records made; H. J. Jeffery contributes Notes on the Coleoptera of the Island, with list, and H. F. Poole, Additions to the Lepidoptera. There are Meteorological Reports, and short natural history notes, all well edited.

The Yorkshire Geological Society has issued Part VI. of Vol. XIX. of its *Proceedings*, which contains a number of valuable papers. These are 'On Differential Earth-Movement in North-east Yorkshire during the Jurassic Period,' by G. W. Lamplugh; 'On a Peculiar Displacement in the Millepore Oolite near South Cave,' by J. W. Stather; 'Some Observations on the Glacial Geology of Furness,' by George Grace and Frederick H. Smith. In addition, T. Sheppard prints his Bibliography of Yorkshire Geology for 1920-21, thus keeping the bibliography, which he compiled a few years ago, up to date. There are obituary notices of three prominent Yorkshire Geologists, Clement Reid, W. Lower Carter, and J. H. Howarth, and while these are somewhat belated, it is fitting that a record of the work of these men should appear in the Society's volume.

FIELD NOTES.

Common Seal on the Yorkshire Coast.—A young common seal was captured on the beach at Aldboro', East Yorks., in November.—C. F. PROCTER.

Carrock Fell erratic at York.—An erratic boulder of Carrock Fell gabbro, weighing about a ton, has been found at a depth of eight feet on the racecourse at York. An effort is being made to preserve it in the Museum Grounds at York. The discovery is referred to at some length in 'A Nature Lover's Diary' in *The Yorkshire Post* for Dec. 7th.—T.S.

Foxes in Craven.—Foxes have increased to such an extent in Craven, and are causing so much damage that for several years the Craven Farmers' Association has been paying a monetary reward for each fox destroyed. Regular batteries are arranged with the object of reducing their numbers. On Sunday, Dec. 10th, forty 'guns,' accompanied by about one hundred beaters, set out from Skipton for a strenuous day's 'hunting.' The result was considered very satisfactory—the 'bag' consisting of two fine dog foxes weighing 18 lbs. each, and two vixens, one weighing 14 lbs. and the other 12 lbs. Two other foxes were seen, one of which was supposed to have been wounded. On the same day another party 'hunting' in the Long Preston and Settle district, shot a dog fox weighing 17½ lbs. and two vixens each scaling 14 lbs. On the same day another dog fox weighing about 16 lbs. was shot near Helli-field. Foxes in Craven have had a fine time for a few years, but they are having a very lively one now.—H. B. BOOTH.

Mammoth Tusk found near Islip.—Towards the end of November last, there was discovered in a gravel pit on the side of the Nene Valley, near Islip (Thrapston), a mammoth tusk, which by permission of Mr. S. G. Stopford Sackville is now on view in the Northampton Museum. It was found 12 to 14 feet below ground level in the lowest part of the River Gravel; indeed, the pointed end of the tusk curved downwards into the underlying Lias Clay; the position would be several feet above present river level. The tusk is moderately perfect, though very fragile (as is usually the case), and measures 5 feet 4 inches in length. This specimen, although much smaller than some that have been found, is, I believe, the largest that has been actually extracted in such good condition from the Nene Valley gravels. Incidental to the above record of a tusk found in Northamptonshire, it is interesting to remark that the great French naturalist, Cuvier, in his work, '*Recherches sur les Ossements Fossiles de Quadrupèdes*,' published a century or more ago, refers to an elephant's tooth found near Northampton, which it had previously been argued by Cuper belonged to the elephant which Polyænus says Cæsar brought to Britain.—BEEBY THOMPSON.

Polecat in Shropshire.—I have just seen a Polecat that was killed on Sir William Rouse-Broughton's property at Downton, near Ludlow, Salop, on Oct. 21st, 1918, which, judging from the size of the set-up specimen, was a fine male. I examined it carefully, and it is a genuine Polecat. The species was considered to be extinct in the county. It may have been a wanderer from Wales.—FRANCES PITT.

Increase of Polecats.—There is a steadily accumulating body of evidence to prove that many of the creatures classed as 'Vermin' benefitted through the War, because their chief enemy—the keeper—was withdrawn. They were left to their own devices, and they lived and replenished the earth. No species has shown this more markedly than the Polecat. Since the end of last century it had been regarded as almost extinct in Shropshire and the neighbouring parts of Wales, though in certain other districts in Wales it still held its own. The district dealt with in these notes is the south-west corner of Shropshire and the adjoining parts of Radnor and Montgomery. Here are my records for the past 21 years :—

1901—One trapped, Cleobury Mortimer, Salop, in April.

Another seen in Wyre Forest, August.

1902—March, one seen in Wyre Forest. All three records in same district.

1912—One trapped, Rhayader, Radnorshire.

1916/7—Three trapped, Petton Park, Salop [probably escaped Polecat-Ferrets.]

1918—Oct. 21st, one killed, Downton, Ludlow, Salop. January 3rd, fresh tracks in snow, Llanllugan, Montg.

1919—November, one of the red variety killed Crosswood, Aberystwyth. Dec. 1st, one killed, Llanberis.

1920—April 2nd, a fine male trapped on Clunbury Hill in S.W. Shropshire. Oct. 3rd, one $3\frac{1}{2}$ lbs. weight, killed by sheep-dog after hard tussle at Garthmyl, Montg.

1920/1—Nine killed on Llandinam Estate, Montg., where they have much increased.

1921—March 11th, one sent in from Llanllugan, Montg.

1922—In the spring of this year one was killed at Llandinam, and another at Berriew. On October 10th, one was killed at Knighton, Radnorshire, where Mr. Owen R. Owen reports them as common of late years, a local taxidermist having had between 30 and 40 to preserve. All the above (except those in 1919) are in one and the same district, but in the spring of this year an adult male and female Polecat were trapped near Llanfyllin, on the north border of Montgomeryshire, where none had been heard of for many years past. All the prior records for the district are given in my *Vertebrate Fauna of North Wales*, q.v.—H. E. FORREST.

YORKSHIRE NATURALISTS AT SCARBOROUGH.

THE Sixty-first Annual Meeting of the Yorkshire Naturalists' Union was held at Scarborough on Saturday, December 9th, 1922. A representative gathering of members from all parts of the county met in the Municipal Secondary School, kindly lent for the occasion by the Corporation. In the intervals between the meetings, members were able to examine a series of highly interesting exhibits, which had been arranged in the Secondary School by local naturalists. A general exhibit including microscopic specimens and a collection of the less common plants of the district was on view in the hall, while another room was devoted to an attractive exhibit of marine biology. The Scarborough Museum was also thrown open to members.

In the evening, the Union was received and welcomed by the Mayor and Mayoress of Scarborough, Councillor and Mrs. G. Whitfield. At the subsequent general meeting the chair was taken by the President of the Union, Dr. T. W. Woodhead, supported by the Mayor and Mrs. Whitfield and by Mr. D. W. Bevan, President of the Scarborough Field Naturalists' Society, who occupied the chair during the President's address. The President spoke on 'Botanical Survey and Ecology in Yorkshire,' and his remarks will appear in due course in *The Naturalist*. A hearty vote of thanks to Dr. Woodhead was passed, both for his address and also for his services to the Union during the year. The thanks of the Union to the Mayor and the Scarborough Corporation for their hospitality and their interest in the meeting was also heartily expressed. A further vote of thanks was accorded to the members of the Scarborough Field Naturalists' Society and the Philosophical and Archæological Society, with particular reference to Messrs. D. W. Bevan, A. I. Burnley, G. B. Walsh, W. S. Rountree and Dr. J. Irving, who had made the local arrangements and organised the exhibits.

After the conclusion of the general meeting, the company partook of refreshments kindly provided by the Mayor and Corporation, and were then entertained by a fine series of lantern slides, illustrating various aspects of the natural history of the district. At the general meeting, ten new members were elected.

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We much regret to record the death of Lady Herdman, wife of Sir William Herdman. Lady Herdman was a student at University College, Liverpool (now Liverpool University), at the time Sir William was a professor there. In 1891 Lady Herdman took her London D.Sc. degree with first-class honours in physics, and the following year became the first president of the Women Students' Representative Council. For many years she was a member of the Liverpool University Court and of the Hostel Committee, which attends to the housing of women students. With Sir William, she was a munificent benefactress of the University, whose interests she had very close to her heart.

The late W. H. Hudson has left in his will a sum of about £8000 to the Royal Society for the Protection of Birds, recording that 'the money I leave to the society is to be used exclusively for the purpose of procuring and printing leaflets and short pamphlets suitable for the reading of children in village schools. The leaflets are to be composed more or less on the lines of those I have written for the society; each is to be illustrated with a coloured figure of a bird, the writing is to be not so much "educative," or "informative," as "anecdotal." This, I find is the easiest way to attract the child's attention to the subject. The coloured picture, the story told, excite that interest and love of the birds which leads to their protection. I think the society should print two or three leaflets of this kind each year, if not more.'

CORRESPONDENCE.

Y.N.U. EXHIBITION AT BRITISH ASSOCIATION MEETING, 1922.

An important exhibit was inadvertently omitted from the account which appeared in *The Naturalist* for November. It was as follows :—

Investigation of the Effects of Pollution on the Fauna and Flora of Yorkshire Streams, by Mr. J. W. H. Johnson.—The Exhibits were to illustrate the following conclusions arrived at in Mr. Johnson's investigations.

- (1) That increase of organic pollution retards the development of the green algæ so characteristic of clean waters, and favours the development of the lowest group of fungi, the Schizomycetes and bacteria.
- (2) That the faunal representatives in polluted waters are characterised by scavenger habits, and frequently live in water in which little or no free oxygen is present so that the fauna (fish, etc.), characteristic of clean streams is unable to exist.

Thus many organisms are characteristic of the intensity of the pollution of the water, while some are even specific.

The organisms when classified according to decreasing amount of pollution fall into three groups, Poly-, Meso-, and Oligo-saprobic forms of life.

A list of the commoner species of each group was given, and exhibits of the two former groups were shown.

Investigation of Salmon Disease.—The investigations have shown for the first time that Salmon disease is apparently endemic among coarse fish in waters removed from Salmon streams. The occurrence of this disease among coarse fish has probably a very important bearing upon the outbreaks occurring in Salmon-bearing waters. This infection is often of dual character, the primary being bacterial and the secondary fungal (*Saprolegnia*).

Illustrations showing the nature of the organism, its mode of infecting the fish, and the appearance of the dead fish were exhibited.—W. R. GRIST.

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We have received Vol. III., No. 3, of *The Murrelet*, 'the official bulletin of the Pacific North-west Bird and Mammal Club, Seattle, Washington,' which is entirely produced by typewriting, and contains a number of interesting natural history notes.

Messrs. Wheldon and Wesley, 2-4 Arthur Street, New Oxford Street, W.C.2, have issued an admirable catalogue of books on Geology, Mineralogy and Mining, which contains an exceptionally complete series of second-hand books for sale, bearing upon the sciences mentioned.

The annual meeting of the Lincolnshire Naturalists' Union was held recently at Lincoln, the Rev. Canon A. N. Claye, D.D., presiding. The secretary (Mr. Arthur Smith) and the treasurer (Mr. J. S. Sneath) presented satisfactory reports. Reference was made to the loss the Union had sustained by the death of the Rev. E. A. Woodruffe-Peacock, who was described as its greatest worker. The subject of the Rev. A. N. Claye's presidential address was 'Some Æcological Factors in Plant Life,' and Mr. H. Preston (Grantham), read notes on the 'Glaciation of Lincolnshire Limestone.' In an ornithological report, Mr. G. H. Caton Haigh stated that an almost unprecedented number of redwings arrived on the coast during the migratory season. On October 15th there was an unusual passage of wild geese, 2000 birds passing over Gransby in an hour. Flocks of wild geese, mostly travelling north-west, were seen on November 5th, 6th, and 7th. Other reports were presented by Miss Stowe (botanical), Mr. H. C. Bee (entomological), and Mr. J. F. Musham (conchological). Dr. Grierson was elected president for the ensuing year, Dr. Willoughby Smith vice-president, Mr. A. Smith hon. secretary, and Mr. R. W. Goulding hon. treasurer.

REVIEWS AND BOOK NOTICES.

Realms of Green, by **Gerald Bull**. London: Simpkin & Co., viii.+260 pp., 6/- net. The author of this work admits that he lays claim to no scientific knowledge, that some are enlarged from articles in *The Countryside*, and that he hopes that they will give the same pleasure that he has received in preparing the chapters. He talks of Wild Fruits and Berries, Beauty of Flowers, Robin Nest, The Face of the Sky, Sitting under a Tree, and so on.

Friends in Feathers, by **Gene Stratton-Porter**. London: John Murray, xx.+335 pp., 15/- net. The writer of this volume is well-known for his work on popular American natural history, and his descriptions, together with the illustrations from photographs which are reproduced, will appeal to the younger generation of naturalists, although the habits and names of some of the birds may be unfamiliar. The account, for example, of the Cow-bird and its egg-laying methods, would well apply to the British Cuckoo.

Lone Swallows, by **Henry Williamson**. London: W. Collins, Sons & Co., x.+245 pp., 7/6 net. Mr. Williamson is well-known from his frequent contributions to various literary and scientific reviews. He has a charming style, reminding us somewhat of Richard Jefferies, and among the thirty-two essays printed in this volume are Lady Day in Devon, A Deserted Quarry in February, Prophet Birds, Sportsmen of the Rubbish-heaps, London Children and Wild Flowers, Peregrines in Love, A Feathered Waster, etc. Many are original, though a few have previously appeared in different journals.

A Naturalist in the Great Lakes Region, by **E. Rowland Downing**. Chicago: The University, xxv.+328 pp., \$3.50. The author of this work is in the School of Education at the University of Chicago, and by using specially selected and quite good thin paper, suitable type, and small margins, has been able to crowd an enormous amount of geological, zoological, and botanical information into what is apparently quite a small volume. There are hundreds of illustrations, and we feel sure that teachers and others interested in out-door life in the vicinity of the great lakes of America will find much of interest and value in the volume. To English readers it is of service for purposes of comparison.

Birds' Haunts and Nature Memories, by **T. A. Coward**. London: F. Warne & Co., ix.+214 pp., 7/6 net. Mr. Coward, whose work in the Lancashire and Cheshire area is so well known, has brought together a number of his contributions to various journals, and with the aid of many fine illustrations from photographs, has produced a very readable book indeed. It includes his Presidential Address to the Manchester Literary and Philosophical Society, entitled 'Preservation of our Fauna.' There are chapters on Puffin Island, The Home of the Shearwater, Memories of a Cheshire Moor, New Year on Solway, An Old Cheshire Wildflower, and Working Men Naturalists of the Past. Occasionally the author goes further afield, and we have chapters on The Spurn, Early Spring in South Devon, etc.

Tommy Smith's Birds, by **Edmund Selous**. London: Methuen & Co., x.+173 pp., 2/6 net. This is by one of our well-known contributors and contains a mine of information on the habits of some of our common birds, the text being so printed as to appeal to the young reader, though this does not interfere with its scientific value in any way. The author explains that he has been obliged to write it for children 'owing, apparently, to such interest not being felt by a sufficient number of the grown-up population to induce any publisher to meet the expense of production.' The birds dealt with are Starling, Melodious Warbler, Red-throated Diver, Nuthatch, Arctic Tern, Avocet, Wild Swan, Chaffinch, Marsh-tit, and Grey Wagtail, and there are four illustrations, three of which are by Mr. Riley Fortune. The book is remarkably cheap.

Frequented Ways, by **Marion I. Newbigin**. London: Constable & Co., xi.+319 pp., 10/- net. Under this title the President of the Geographical Section of the British Association gives a general survey of the Land Forms, Climates and Vegetation of Western Europe, considered in their relation to the Life of Man, including a detailed study of some Typical Regions. The volume is in two parts, and the headings of its chapters probably form as good an indication of the nature of the work as can be given in a short notice. They are The Surface of the Land; Ways to the Sunlit South; Mountain, Hill, and Plain; Rain and Sunshine; The Plant and its Home; The Primeval Forest; Myrtle and Bay; Meadow, Wood and Pasture in the Alps; Moors and Heaths; The Earth and Man; Vineyard, Olive Grove and Garden; The Old Conditions and the New; Where shall we go?; The Realm of Snow and Ice: Essential Features of the Alps; Hills and Valleys in the Dolomites; Naples and Vesuvius: A Study in Volcanic Action; Between the Mountains and the Sea; An Upland Region: The Scottish Highlands; City and Plain in France; The North Italian Plain; Provence and Transapennine Italy: the Development of the Town. Dr. Newbigin has evidently travelled much and has taken full advantage of the information she has obtained during her travels. These results are presented in a very pleasing form in this volume, which will impart many valuable hints to the readers.

British Basidiomycetae, by **Carleton Rea**. Cambridge University Press, 800 pp., 30/- net. At the recent Foray of the Yorkshire Mycological Committee, this result of Mr. Carleton Rea's thirty years' study of this subject was the theme of an interesting discussion. A good feature of the book is that the meanings of the botanical names are shown, on the other hand a new crop of long and highly technical words appears. Rea, no doubt for the sake of brevity, limits his descriptions to the barest terms and brief assertions, which sometimes leave the reader with a wish that a little supplementary explanation had been introduced. He never writes doubtfully, but boldly asserts and leaves the matter. In all recent Mycological works the Agarics have been primarily classified according to spore colouration. In Mr. Rea's book the first division is upon morphological characters, and the sequence of genera differs from all books with which workers have become so familiar. There is a possibility, therefore, that for the quickest determination of specimens the old familiar books may still continue to be used by (shall we say?) old-fashioned workers, though it is clearly recognised that Mr. Rea's book is now the standard work, and must be finally consulted and its use adopted. There are, of course, a number of innovations. The genus *Inocybe* has hitherto included members bearing spores which were roughly differentiated as "elliptical" and "star-shaped." Mr. Rea has introduced the new generic name *Astrosporina* for the last-named group. A number of *Collybias* is transferred to *Marasmius*. The genus *Paxillus* is transferred from the Company of the *Agaricineae*, or gill-bearing fungi, to that of the *Boletineae*, or pore-bearing fungi. This removal is, perhaps, scarcely justifiable. Whatever affinities *Paxillus* may have with the polypores, *Paxillus* possesses gills of perhaps two inches in length, and it is only in a few of the species of this genus that the gills anastomose or form a pore-like process, measured by the fraction of an inch, on joining the stem. The excellent work during recent years of Mr. A. D. Cotton and Miss E. M. Wakefield in connexion with the *Clavarias* and *Resupinate* fungi is embodied in this publication. There is a very complete Bibliography, but no glossary. Synonyms are given in all cases. Every working Mycologist must possess a copy of this work, and we must all be very grateful to the author for giving to the world the result of his long study.—A. E. PECK.

NEWS FROM THE MAGAZINES.

Miss Frances Pitt writes on 'The Great and Arctic Skuas in the Shetlands' in *British Birds* for December.

C. L. Walton makes Observations on the Genus *Bombus*, in *The Entomologist's Monthly Magazine* for December.

J. P. Burkitt writes on 'Birds' Song,' and D. R. Pack-Beresford on 'Some New and Rare Irish Spiders,' in the *Irish Naturalist* for November.

'The Herring Fishery and its Fluctuations' is the title of an interesting article by B. Storrow of the Dove Marine Laboratory, Cullercoats, in *Nature*, No. 2729.

T. A. Sprague gives 'Floral Variation in *Veronica persica*,' and M. J. Godfrey writes on 'The Fertilisation of Orchids,' in *The Journal of Botany* for December.

Profusion of *Colias edusa*, Diptera new to Lancashire and Cheshire, Greater Black-backed Gull in the Isle of Man, and other similar items, appear in *The Lancashire and Cheshire Naturalist* for October.

The Museum Journal (Philadelphia), for September, is almost entirely occupied by an account of Ancient London, dealing with its geological, archæological and mediæval history, by B. G. Gordon.

The Geological Magazine for December contains Reports on the discussions on The Geological History of the North Sea Basin, and on Wegener's Hypothesis of Continental Drift, which took place at the Hull Meeting of the British Association.

In *Nature*, Nos. 2766 and 2767, Dr. D. H. Scott gives the 'Early History of the Land Flora'; and a summary of the discussion on 'Man and the Ice Age' which took place at the Hull Meeting of the British Association, also occurs in No. 2766.

Among the contents of *The Journal of Ecology* for November, we notice, 'Early Stages of Redevelopment of Woody Vegetation on Chalk Grassland,' by A. G. Tansley; 'Studies of the Somerset Turf Moors,' by M. M. Baker and C. M. Gibson; and '*Primula elatior* Jacquin: Its Distribution in Britain,' by Miller Christy.

The Hastings and East Sussex Naturalist, Vol. III., No. 5, edited by Anothony Belt, contains some articles of particular local interest, 'Sussex Diplura,' by R. S. Bagnall; 'Sussex Dragon-Flies' and 'Earliest and Latest Dates of Flight of Odonata,' both by A. E. Craven; and 'Notes on the Local Fauna, Flora, and Meteorology,' by W. R. Butterfield.

We learn from *The Montreal Star* that recently, "at Lookout, a man was treed by four brush wolves. Soon two of them moved off. Shortly after the two animals returned with a beaver between them. They forced the beaver to begin to work on the tree, but before it had quite finished gnawing through the trunk a party of hunters came along, and a tragedy was averted." Which seems a pity!

We much admire the new appearance of *The New Phytologist*, and the way in which its date of issue, etc., is now shown. The part issued on the 7th November contains a continuation of Walter Stiles' 'Notes on the Water Relation of the Plant Cells'; 'The Water Relation of the Plant Growing Point,' by J. H. Priestley and T. M. Tupper-Carey; Laboratory Notes; and Notices to Mycologists.

Dr. Collinge favours us with copies of two of his papers which have recently appeared in *The Linnean Society's Journal*, in one of which he describes a new genus of Terrestrial Isopod, *Calmanesia* after Dr. W. T. Calman of the British Museum, and the trivial name *methueni* is apparently in honour of the collector, P. A. Methuen. In the other paper it is interesting to find that he is able to identify a species of *Eluma* (*purpurascens*) from Budde-Lund as identical with *E. cælatum* from the Hill of Howth, County Dublin, Ireland.

NORTHERN NEWS.

The daily press records a common buzzard near Worksop, Notts., in December.

Mr. R. J. Welch has been elected President of the Conchological Society of Great Britain and Ireland.

The note on 'Sap of Fir Trees attractive to Bees,' on pages 399-400 of *The Naturalist* for December, should have been signed by F. D. Welch.

Mr. T. R. Goddard, Assistant Curator of the Sunderland Museum, has been appointed Curator of the Hancock Museum, Newcastle-on-Tyne.

A skull of an adult female Siberian mammoth, with tusks 6 feet in length, has been placed in the Natural History Museum, South Kensington.

Professor T. J. Jehu is giving twelve lectures on 'Fossils and what they Teach,' in the Lecture Theatre of the Imperial College of Science, London.

The death is announced of H. J. Elwes, F.R.S., the well-known entomologist, in his 77th year. He wrote a book on the 'Trees of the British Islands.'

The death is also announced of Sir Isaac Bayley Balfour, F.R.S., the distinguished botanist, and of Charles H. Ashdown, of St. Albans, the well-known archæologist.

A particularly fine series of works dealing with the fauna and flora of the Liverpool area is listed in the catalogue of books for sale recently published by W. C. Elly, of Liverpool.

We notice that the late R. Braithwaite's work on 'The Sphagnaceæ, or Peat Mosses of Europe and North America,' is for sale by a well-known London Bookseller for the low price of six shillings.

The death is announced of John Henry Gurney, the well-known ornithologist, whose contributions to Norfolk Natural History have a world-wide reputation. An excellent appreciation appears in *The Norfolk News* of November 11th.

The Public Library and Museum Committee, Tulley House, Carlisle, has issued a second edition of Haverfield's 'Catalogue of the Roman Inscribed and Sculptured Stones in the Carlisle Museum,' in which 149 pieces are described, and many illustrated.

We regret to record the death of the Rt. Hon. Lord Sudeley, at the age of 82. In recent years Lord Sudeley has taken a keen interest in the question of popularising our museums, and certainly largely due to his enthusiasm many of the recent innovations in connection with Guide lecturers, etc., in our National Museums, have been made.

Mr. A. E. Peck informs us that in October last he saw hampers of the 'Hedgehog Mushroom,' *Hydnum repandum*, for sale in the Market and shops of Cologne, the price in one case being 35 marks per pfund. In the Zoological Gardens there, he observed *Schizophyllum commune* on a fallen branch. The species is rare in Britain, and is regarded as sub-tropical.

The Royal Society has recently awarded the Copley Medal to Sir Ernest Rutherford, for his researches in radio-activity and atomic structure; the Rumford Medal to Professor Pieter Zeeman, for his researches in optics; a Royal Medal to Mr. C. T. R. Wilson, for his researches on condensation nuclei and atmospheric electricity; a Royal Medal to Mr. J. Bancroft, for his researches in physiology, and especially for his work in connexion with respiration; the Davy Medal to Professor J. P. Thorpe, for his researches in synthetic organic chemistry; the Darwin Medal to Professor R. C. Punnett, for his researches in the science of genetics; the Buchanan Medal to Sir David Bruce, for his researches and discoveries in tropical medicine; the Sylvester Medal to Professor T. Levi-Civita, for his researches in geometry and mechanics; the Hughes Medal to Dr. F. W. Ashton, for his discovery of isotopes of a large number of the elements by the method of positive rays.

THE YORKSHIRE NATURALISTS' UNION'S SIXTY-FIRST ANNUAL REPORT FOR 1922.

(Presented at Scarborough, December 9th, 1922).

The **Sixtieth Annual Meeting** was held at Hull, on Saturday, December 3rd, 1921. The report of the work of the Union during the year 1921 was adopted and subsequently published in *The Naturalist* for January, 1922. At the General Meeting in the evening, the Chair was occupied by the Rt. Hon. the Lord Mayor of Hull, Councillor G. F. Wokes, and the Presidential Address was delivered by Mr. H. B. Booth, M.B.O.U., F.Z.S., on 'The Migration of the Common Swallow.' The address has since appeared in our journal (pp. 55-60, 85-91). Hearty votes of thanks were accorded to the Lord Mayor for his kindness in presiding at this meeting, and also to Alderman J. Pybus, Chairman of the Museums Committee, for placing the City Museum at the disposal of the Union.

President.—At an Executive Meeting held in the Philosophical Hall, Leeds, on November 12th, 1921, Dr. T. W. Woodhead, M.Sc., F.L.S., was unanimously elected President of the Union. The Executive wishes to record its appreciation of the great interest taken by Dr. Woodhead in the work of the Union during the year.

Field Meetings have been six in number, viz., Clitheroe (Easter, April 15th to 17th); Bingley (May 13th); Thornton Dale (Whit-week, June 3rd to 5th); Filey (July 15th); Newbiggin (Bank Holiday, August 5th to 7th); and Buckden (Mycological meeting, September 30th to October 5th). In addition, sectional field meetings have been held by the Botanical Section (Middleham), Entomological Section and Galls Committee (Askham Bog and Stubbing Moor), Geological Section (Halifax), and Marine Biology Committee (Scarborough). On the whole these meetings have been well attended, but their popularity has been diminished by the high railway fares. The railway companies are, however, now shewing some willingness to make concessions, and facilities have been accorded by the North Eastern Railway Company for the Filey meeting, and also for the Annual Meeting at Scarborough. Owing to its accessibility, the meeting at Bingley in May proved almost a record gathering, 160 members and associates taking part in the proceedings.

The quickened activity of the Union's various sections, especially the holding of sectional meetings and excursions, is very encouraging, but the position is liable to be misunderstood. The finances of the Union are limited, and it is not possible to notify each member of the Union by separate post of all these sectional meetings; they are, however, all advertised beforehand on the inside cover of *The Naturalist*. The secretaries of the various sections do endeavour to send a reminder to members they know who generally attend on these occasions, and they would be pleased to place on these lists any who have previously not received notice, and who will write the secretaries on the subject. The cost of such notices is met by the sections concerned.

The Excursions for 1923 will be as follows:—

Yorks.,	S.E.—April 2nd	Bridlington.
„	N.E.—May 21st,	Helmsley.
„	Mid.W.—June 16th,	Middlesmoor.
„	S.W.—July 14th,	Penistone.
„	N.W.—Aug. 6th,	Bedale.

Membership.—The number of new members is satisfactory, considering the present unsettled conditions, but these accessions have been counteracted by a considerable number of resignations and deaths.

The membership now stands at 427, the following being elected during the year :—

Binns, Rev. C., 7 Melrose Crescent, Withernsea, E. Yorks.
 Bisat, Mrs. E. A., 1 Selwyn Avenue, North Ferriby, Hull.
 Dibb, H., 106 Bradford Road, Shipley.
 Dixon, Miss A., F.R.M.S., Broadwater, Pine Road, Didsbury, Manchester.
 Evans, Capt. S. E., M.A., 32 Thorne Road, Doncaster.
 Fawcett, C. B., B.Litt., M.Sc., The University, Leeds.
 Fisher, J., 61 Gargrave Road, Skipton.
 Garstang, Miss S. L., B.A., Meanwood Lodge, Stonegate Road, Leeds.
 Hellewell, G. L., 3 Green Hill Street, Bradford.
 Hewlett, Miss M., Greenhead High School, Huddersfield.
 Hilary, H. O., 15 Plevna Terrace, Bingley.
 Hirst, Albert, "Broomfield," Longwood, Huddersfield.
 Johnstone, R. H., 7 Hamilton Place, Leeds.
 Lyle, G. T., F.E.S., "Brierfield," Shibden, Halifax.
 Mander, Miss M., Ashgyl, Bingley.
 Marshall, Rev. C. C., M.A., St. Chad's Vicarage, Far Headingley, Leeds.
 Maughan, J., Estate Office, Jervaulx, Yorks.
 Morland, Miss M., 10 Leylands Avenue, Heaton, Bradford.
 Phelon, H. V., M.B., Ch.B., School of Medicine, Leeds.
 Roberts, Ernest E., M.A., 6 Sholebroke Avenue, Leeds.
 Robertshaw, W., Haslemere, Woodville Road, Keighley.
 Rogers, Rev. F. A., 5 Cromer Terrace, Leeds.
 Rollinson, Miss A. R., B.Sc., A.C.G.I., Whitcliffe Mount School, Cleckheaton.
 Rowe, J. H., 88 Horton Grange Road, Bradford.
 Rowe, O. H. C., 88 Horton Grange Road, Bradford.
 Scott, Miss L., B.Sc., Lyddon Hall, Virginia Road, Leeds.
 Seaton, H. T., Kingswood, Grimscar, Huddersfield.
 Simpson, Miss M., Zoology Dept., The University, Leeds.
 Smith, A., 23 First Avenue, York.
 Smith, F. B., M.D., 68 Cold Bath Road, Harrogate.
 Steele, R. J., M.B.E., 2 Whetley Grove, Bradford.
 Wright, W. B., Inglewood, Burlington Road, Altrincham.

Affiliated Societies.—The Mexborough Secondary School Scientific Society, with a membership of one hundred, has been affiliated with the Union. The total numerical strength of the Union is now 3170.

Obituary.—The Executive regret to record the deaths of the Rev. E. A. Woodruffe-Peacock and Thomas Audas.

British Association.—The British Association met this year at Hull. The Union's delegate, Mr. T. Sheppard, was the local organising secretary, and much of the success of the meeting must be attributed to his organising capacity.

The delegate of the Yorkshire Naturalists' Union, Mr. T. Sheppard, reports that the Conference of Delegates at Hull took a rather different form from that of recent years, there being no official president nor presidential address. The constitution and personnel of the Corresponding Societies' Committee has been changed, the President of the British Association, Sir Charles Sherrington, being the Chairman of the Committee, Mr. Sheppard being the Vice-Chairman. The office of Secretary has been dispensed with, the secretarial work in future being carried out at the offices of the British Association. Two conferences were held during the British Association meeting at Hull, and subjects of importance to Corresponding Societies were discussed. Special mention was made of the excellence of the Yorkshire Naturalists' Union exhibit, and the Council of the British Association has expressed the

hope that at future meetings of the Association similar exhibitions may be organised. Details of this exhibition as well as the report of the British Association meeting have been given in *The Naturalist*.

The Naturalist has appeared regularly, though, on account of the printers' strike, the August number was so delayed that it was considered advisable to issue a double number for August-September, which appeared on the 1st September. This seems to be the first occasion on which *The Naturalist* has not appeared with its usual promptitude on the first of the month. The blocks used in the illustrating of Mr. Sheppard's articles have been presented, as have also those illustrating Mr. H. S. Gladstone's paper ; two blocks used in illustrating the Report on the Filey Excursion were kindly lent by Messrs. Brown, Ltd.

The Presidency of the Union for 1923 has been offered to and accepted by Dr. A. Smith Woodward, F.R.S., F.L.S., F.G.S.

VERTEBRATE ZOOLOGY SECTION.

North Riding (W. J. Clarke):—During the summer of 1922, the numbers of the smaller migratory Warblers were fully maintained. In the case of Whinchats and Landrails an increase in numbers was observable, while the Turtle Dove has been very numerous in the Scarborough district. Bullfinches and Grey Wagtails have been below their usual numbers, and the Common Bunting has been very scarce. A pair of Yellow Wagtails nested at Scarborough and reared five young during June, 1922. Goldfinches have not been quite so abundant in the Scarborough district as in recent years, but considerable numbers of pairs have nested in the neighbourhood of Whitby. An adult Wryneck was captured at Scarborough on September 9th, 1922, and on the same day one was seen at Whitby. Two white varieties of the Willow Warbler were noted at Scarborough in July, 1922, both in the same brood. During November, 1921, four Mealy Redpoles frequented the Mere at Scarborough for some time. Waxwings appeared at Scarborough in considerable numbers from November 14th, 1921, to February 20th, 1922, as many as twenty being observed in a single flock. In the Whitby district many were seen during the winter from November 18th, 1921. On December 14th, 1921, a Song Thrush was sitting upon four eggs at Scarborough. A clutch of five Tawny Owls' eggs was well incubated at Scarborough on March 20th, 1922. A pair of Merlins nested on the moors near Scarborough in May, 1922. Several migratory Red-legged Partridges appeared at Scarborough during March and April, 1922. A Quail was captured at Whitby on June 5th, 1922. During the latter half of December, 1921, a Bittern frequented the Mere at Scarborough, and was frequently seen. A Green Sandpiper occurred near Scarborough on June 9th, 1922. A Little Stint was shot at Whitby in the autumn of 1922. At the same place a Grey Phalarope frequented the harbour from November 10th to 15th, 1921. A Goosander appeared at Scarborough on February 25th, 1922. An immature Grey Lag Goose was shot near Scarborough in January, 1922, and at the same place and time three Whooper Swans—one adult and two immature—made their appearance. Fulmar Petrels were seen in or near the Castle Cliff at Scarborough on May 21st, 1922, when two were observed, and on June 4th, 1922, when five were moving in and out of the Cliff. A Black-throated Diver stayed at the Scarborough Mere for several days in January, 1922, during severe frost. A few Little Auks passed Scarborough in November, 1921. Several Great Skuas were observed at Whitby during September, 1922. The colony of Black-headed Gulls on Whitby Moors had a very successful season, about two hundred pairs nested, and large numbers of young were reared. At Whitby a Slavonian Grebe occurred on February 4th, 1922, and a Red-necked Grebe, on February 17th, 1922. The recorder is indebted to Mr. T. N. Roberts, of Scarborough, and Mr. F. Snowdon,

of Whitby, for notes which have been of assistance in compiling this report.

West Riding (H. B. Booth) :—The following notes are in addition to those appearing in *The Naturalist*. Great Northern Diver (*Colymbus immer*). On December 21st, 1921, five large strange birds descended on to Thornton Reservoir, near Bradford. The reservoir keeper, Mr. Hesketh, obtained one of them with a view to his Christmas dinner. The following day Mr. Fred Rhodes secured it for the local collection at the Cartwright Hall Museum, at Bradford. Its plumage appeared to be in the last stage of immaturity. On January 8th, Mr. F. Rhodes received a young Shag alive that had been caught on Messrs. Lister & Co.'s (Ltd.) dam at Manningham, Bradford. It had been feeding on Goldfishes, which are plentiful in the dam. It was very savage, and a man bought it for half-a-crown from some workmen who were tormenting it with dogs and sticks, and it was handed over to Mr. Rhodes on condition that he should liberate it at a suitable place. This was done the day following at the Yeadon reservoir on the edge of Rombalds Moor.

A female Red-breasted Merganser was obtained on Silsden Reservoir on January 30th, and is now in the Keighley Museum (Mr. R. Butterfield).

Terns.—On June 8th, Mr. W. G. Bramley watched a Black Tern at Fairburn, near Castleford. At the same place, two days later, he identified a pair of Common Terns. He reports :—‘There is no doubt about them, as I got a good view at about fifty yards distance, and could distinguish the dusky tip of the beak.’

Oystercatcher.—Mr. A. Haigh Lumby reported two in Halton Gill, Littondale in August.

Geese.—I was surprised to see about fifteen Geese fly over City Square, Leeds, in an uneven ‘V’-shaped formation (*i.e.* one line longer than the other), at 7.45 p.m. (s.t.), on June 6th. They were soon out of sight, owing to the high buildings, and were going in a north-easterly direction. I can only imagine that they were semi-domesticated Canadian Geese. On October 22nd several ‘gaggles’ of Geese were reported as passing overhead in the Skipton and Ilkley districts.

Heron.—The Eshton Herons have again nested across in Lord Wood, in about the same numbers. The Hubberholme heronry is still thriving, and the keeper (Mr. Cambridge) tells me there were at the least eight nests—probably ten. They nest here in a wood of very fine old Spruces, and from below it is often very difficult to be certain whether a tree contains a nest or not. They can be watched better (with a pair of good field-glasses) from the road below. When I was there two of the nests, that had contained eggs, were blown down. Col. Tottie verifies the report that for the last four or five years a pair nested in a tall tree near the Church at Coniston Cold, near Bell Busk.

Great Crested Grebe.—This species has undoubtedly increased as a breeding species during the last few years. This season two pairs have frequented Malham Tarn, and probably each pair has attempted to nest. One pair twice made a nest on a submerged island at the beck mouth, and on each occasion the nest was washed away by the rush of water, just about the time when the eggs should be hatching. Shortly after that (in July), a mother bird appeared with three young ones (Mr. A. Ward). Col. Tottie (per Mr. R. Butterfield) has kindly supplied the following interesting notes respecting this species on his lake at Coniston Cold, near Bell Busk. The Great Crested Grebe first appeared on the lake on April 3rd, 1914, and nested later the same year. Each season since a pair has returned, nested and reared a small brood. On May 21st, of this year, a second pair was seen, but was driven away by the nesting male. It was probably a young male of last year's brood, that had been driven away earlier, and had returned with a mate. Mr. C. A. Cheetham reports that he has seen the Great Crested Grebe frequently on Chelker Reservoir, near Addingham, during the nesting season. Doubtless they

will have nested, or endeavoured to nest ; but these birds find many difficulties in nesting in reservoirs owing to the fluctuating levels of the water, as in the Leeds reservoirs in the Washburn valley, where they are often left high and dry, or even swamped occasionally. Mr. W. G. Bramley informs me that this species has nested near Fairburn this year, and also for the past two or three seasons.

Gulls.—No Lesser Black-backed Gulls nested near Malham Tarn this year, and the reason is not difficult to guess. Although an undesirable bird amidst Grouse moors, yet I feel rather sorry about the disappearance of this small nesting colony, which is the only one of the Lesser Black-backed Gull I have known in Yorkshire. The small new nesting colony of Black-headed Gulls on Lanshaw Dams, near Burley-in-Wharfedale, has done rather better this season. There would be about twenty pairs at the least, and on one occasion we counted thirteen nests containing eggs.

Ducks.—Mr. W. G. Bramley reports that both the Shoveller and Tufted Duck nested at Fairburn this year.

Owls.—An Owl's nest containing three eggs was found by a game-keeper, on the ground amidst long heather, on the Hazelwood Moor, near Bolton Abbey, on June 2nd, and quite a mile and a half from the nearest trees. On the plea that these birds were destroying Grouse, he shot the female bird at the nest. The late date, and the site of the nest, naturally lead to the assumption that it was a nest of the Short-eared Owl. The Rev. C. F. Tomlinson, Rector of Bolton Abbey, walked to the nest three days later, and secured an egg, which was just slightly incubated. Noticing the lengths of the so-called ears of the dead bird, he pulled out a primary and a tail feather, which he forwarded to me, and proved to be those of the Long-eared Owl. It is probable that their first nest had been interfered with.

The Barn Owl has been slowly but steadily decreasing in this district for quite a quarter of a century. I am glad to say that there are distinct signs of a slight increase in numbers again during the last year or two in Upper Wharfedale, which should be good news for the farmer and bird lover alike. The Rev. C. F. Tomlinson sent me some very interesting notes respecting a pair that nested for two years at Bolton Abbey. Shortly after appearing at the nesting site this season, he picked up a dead Barn Owl from the ground just below the nesting site. This he considered to be a fight to the death between two males for the female. The following data on visits to the nesting site are of interest, particularly the very lengthy stay of the young in the nest, compared with the other owls.

May 29th.—Six eggs (partly incubated).

June 10th.—Three young hatched.

June 15th.—All six hatched.

August 23rd.—All left the nest, excepting the last hatched, which was left behind, and apparently died of starvation.

Woodcock, Dunlin and Black Game.—Still nesting fairly commonly in Upper Wharfedale. Mr. M. Longbottom states that a pair—or possibly two pairs—nested in Howden Woods, near Silsden. On June 8th I was surprised to find Dunlin's nest containing four eggs, just on the point of hatching, on the Ilkley side of Rombald's Moor. Although we do occasionally see stray Dunlins on these moors during the breeding season, we usually put them down to be young, or otherwise non-breeding birds. Mr. E. W. Taylor reports two or three pairs nesting on a moor further to the north of the Riding, where the Dunlin is known to nest each year. Black Game are still increasing in extreme Upper Wharfedale, and several have been seen or shot on the Denton Moors, and in the Washburn Valley. As the Leeds waterworks afforestation scheme develops in the latter valley, it is probable that Black Game will become regular denizens of it.

Mr. C. A. Cheetham reports that he has seen Common Buzzards on the north-west fells of the Riding, both before, during and after the nesting season. Whether these are birds that are nesting in the county, or over its borders, it behoves some of our younger members, who are strong of limb and lung, to prove.

Among miscellaneous notes, Mr. W. G. Bramley states that Bramblings were quite numerous amongst flocks of Chaffinches, in the Fairburn district last winter ; in the same area the outstanding feature in bird-life was the complete absence, through no apparent reason, of breeding Yellow Wagtails. Turtle Doves were numerous during the autumn migration, as many as 25 to 30 being seen at one time. Mr. Riley Fortune reports that Red-legged Partridges continue to increase near Harrogate, and that Hawfinches have increased so rapidly around Boston Spa that they have become a pest to the gardeners.

Mr. W. H. Parkin states that a Thrush's nest in Northcliffe Wood, Shipley, had been used to rear two broods in 1921, and two broods again in 1922, with but little repair.

The spring and summer were cold and wet. The summer immigratory birds were as a rule late in arriving, although on April 26th I was surprised to see two Spotted Flycatchers in Bolton Woods—they would be about three quarters of a mile apart, so that they would not be likely to be the same bird seen twice. I have never before seen this species in April. The nesting season, owing to the weather, was unfavourable, but I believe that most species have done better than was expected. Mr. W. H. Parkin reports seeing a Swift at Shipley on September 17th. The Swifts were last seen at Ilkley and Ben Rhydding on August 19th, excepting four birds, which remained one day longer. Several pied Blackbirds have been reported from the neighbourhood of Ilkley. The Rev. C. F. Tomlinson informs me that a very dainty and attractive white variety of the Pied Wagtail appeared about the Abbey, and the stepping stones, at Bolton Abbey, on August 3rd, and remained until August 10th. It was pure white, except for a smoky patch on the head and upper part of the back.

East Riding (E. W. Wade) :—An exceptionally long and, in Central and North Europe, severe winter, the severest recorded for 50 years, following a year of almost unprecedented sunshine and drought, led one to expect the same sudden awakening of bird life which followed the sever winter of 1915-1916, but the winter here, though prolonged, was not severe, and the stimulus to the sudden renewal of reproductive activity seems to have been wanting, in spite of sunny weather in May and the greater part of June. The season has been unfavourable to many species of birds. Some malign influence appears to have curtailed their vitality, and their breeding has been late and irregular. Possibly the retarding influence of last year's drought on the food supply has been responsible.

The Peewit is scarcer even than last year, and enquiries in various parts of the East Riding confirm the unwelcome fact that as a breeding bird it is steadily disappearing.

Rooks were slightly less fertile than in 1921, and rather late. The experiment of taking all the eggs in a rookery was continued. The number of nests tenanted was half that of last year, and at the second visit in May was again halved. The tenacity of the bird is remarkable.

The breeding of the Owls was uncertain and irregular, mice and voles being scarce. In some cases, Brown and White Owls did not lay at all. The Little Owl is recorded as breeding in a remote part of Holderness, and seems to have spread over the whole of the East Riding.

Thrushes and Blackbirds were abundant, nine pairs breeding in the writer's garden. Thrushes' nests, in more than one instance, were only 12 feet apart, three clutches of eggs were generally produced.

The aftermath of last year's drought was seen in the late and irregular

breeding of the Waders. Snipe and Redshank, though present in the usual haunts, generally showed no sign of nesting by the first week of May. The Shoveller, also, was absent from its usual haunts, the shallow ponds being dried up.

Migrants arrived about the usual dates, an exceptional record being the Nightjar, shot near Beverley on 18th April, but Warblers, particularly the Common Whitethroat, were generally scarce and late in breeding. On 28th May, one of our migrant nights in Hull occurred, a multitude of Waders flying over the city and keeping people awake at midnight.

Goldfinches show a decrease on last year's numbers. The Tree Pipit was exceptionally scarce in the East Riding. Even the Yellow Hammer, one of our hardiest birds, was conspicuously scarcer and later in breeding than in 1921. Swallows and House Martins have in some cases returned to haunts untenanted last year, and in some cases show a gratifying increase in numbers. All but a few stragglers had left us by the end of September, showing that the breeding season was a short one. On 25th Aug., Mr. C. W. Mason observed a large flock of House Martins settle on a grass field. The Swifts were slightly less in numbers and late in departing, the last flock being seen on 19th and 21st September.

Of the Corncrake only seven pairs were recorded against 12 in 1921. The Whinchat shows no change in numbers. The Lesser Redpoll and Turtle Dove are more numerous, the latter being as common as the Ring Dove in some parts of the Wolds.

The unfavourable season seems to have extended to the supply of small fish and sand eels, herring sile being very scarce. Probably in consequence of this the egg season at Bempton was a short one, the second laying deficient, and the third very poor. Well marked eggs were absent. The Lesser Tern in the Spurn area straggled in from 2nd to 31st May, and only about two-thirds of last year's numbers nested. Large flocks of Common and Arctic Terns were wandering about the coast in June, when they should have been at the nesting sites. They were fishing in Hornsea Mere, and flying overland westward in the Bridlington area.

The Magpie unfortunately continues to increase in South Holderness.

On 22nd Aug., a small skein of Pink-footed Geese flew over Scampston, and on 17th Sept. the birds were on the Humber.

The Woodcock again bred at North Cliffe.

The Corn Bunting has decreased of late years, being absent from districts west of Hull, which it used formerly to frequent.

The Kittiwake has increased in recent years on Bempton Cliffs, and is ousting the Guillemot from some of its favourite ledges. Unfortunately, also, the Herring Gull is on the increase.

Partridges again are patchy in Holderness, the heavy rain having in many cases wiped out the young coveys.

The severe winter abroad caused an unusually large immigration of Waxwings. In Nov.-Dec., 1921, the birds were recorded at Sutton, Spurn, Beverley, Barmston, Bridlington and North Lincolnshire.

A Rough-legged Buzzard was at Hornsea on 19th February, 1922.

A pair of Gadwalls was recorded on Hornsea Mere in September, 1922, and it is to be hoped that they may stay to breed there some time.

A small flock of Bean Geese frequented Hornsea Mere all last winter.

A Slavonian Grebe was on the Driffeld stream for a fortnight early in March.

A Reeve was seen on Hornsea Mere on 7th August.

The Bearded Tit has not been seen on Hornsea Mere at all this year, and must be recorded as finally extinct.

York District (Sydney H. Smith) :—The year has been the exact opposite of 1921 so far as the weather is concerned, and the effect upon bird life is marked by the destruction of both eggs and young of many species, particularly ground nesting varieties and game birds. Sunny

days in April and early May raised hope that another fine year was in store. Such, however, was not to be, and how wet and disastrous were the months of June, July and August need not be recapitulated here. So far as this district is concerned I have never known such a scarcity of migrant species, such as Swallows, Sand and House Martins, Whinchats, Whitethroats, Landrails, etc. The latter is almost a back number. I have only heard two during the whole season, and Mr. Zimmermann tells me he also has only heard two, and this in a district where twenty years ago the noise of the Corncrake was dominant in almost every meadow.

In *The Naturalist* of February, 1922, I recorded the occurrence of the Little Auk and a Water Rail, both at York, on November 12th, 1921, and for the first time in twenty years two Shags were killed on the River Ouse at York, one on January 6th, and the other on January 11th, 1922. Evidently a little party of these birds had been driven inland by the hard weather prevailing at the time, as another Shag was killed at Pocklington on January 6th, 1922.

The year is marked by the visitation of Waxwings. On January 20th two were noticed at Huntington, 3 miles from York, afterwards a third was seen, and the party stayed for three weeks. On January 28th, one was killed at New Earswick, and recorded by Dr. Gaynor. Three more were seen on January 25th at Bilborough, near York, and five frequented the York and Selby road in the vicinity of Riccall, and were last seen on January 31st.

A Golden Eye Duck was shot at Sandburn on January 12th, and brought in for identification by Mr. John Hetherton.

During January and February a large flock of Wigeon, Mallard, and Tufted Duck frequented Mr. H. E. Leatham's pond at Dringhouses, York, and a pair of Great Crested Grebes appear to have settled there definitely.

July 9th, a pair of Great Crested Grebes made their nest on the lake at Castle Howard, and sat boldly in full view of the highway to Slingsby, and ultimately brought off their young. Another pair were also seen, but I have no record of their having nested.

Numbers of Mealy Redpolls and Bramblings were seen about Dringhouses during January and February, and the local bird catcher took a heavy toll of the visitors.

Goldfinches, Hawfinches and Bullfinches appear to be increasing in number.

On January 14th, a Robin's nest with four eggs was found in an outhouse at the Union Workhouse, York, but before incubation was completed a heavy snow storm filled the nest and drove the birds away.

Long-eared and Tawny Owls have nested well in the neighbourhood of York.

Magpies, Carrion Crows, and Jays have been very numerous, and there appear to be more Green Woodpeckers about, particularly at Skipwith. At this place the colony of Black-headed Gulls is well populated, and other species that have nested in good numbers are Mallard, Teal, and Shoveller Ducks, and a pair of Tufted Ducks hatched eleven young.

On May 4th, Sir Edward Brooksbank, of Healaugh, reported eight pairs of Herons as nesting in the Shire Oak Wood at Healaugh.

On August 1st, Mr. Leonard Wray, of Huntington, picked up a Heron which had been in collision with the telegraph wires, and had broken one wing.

During the summer a pair of nearly white Sparrows frequented the grounds of the Yorkshire Philosophical Society, York.

MIGRANT AND GENERAL NOTES.

Mar. 17.—Swallow first seen at Bulmer. A small flock there on the 19th.
 „ 17.—Chiff Chaff first seen at Bulmer, and at Shipton, York, April 14th.

- Mar. 17.—Willow Warbler first seen at Bulmer, and at Shipton, April 14th.
 „ 17.—Yellow Wagtail first seen at Bulmer, and at Sandburn, May 4th.
 „ 19.—Whitethroat first seen at Bulmer, and at Beningbrough, April 14th.
 Apr. 14.—Three pairs of Sandpipers seen on the River Ouse at Poppleton.
 „ 14.—Sand Martins and Tree Pipits, first seen at Beningbrough.
 „ 16.—House Martins arrived at Beningbrough.
 „ 16.—Blackcap Warbler seen at Healaugh.
 „ 16.—Redstart first seen at Healaugh.
 „ 17.—Cuckoo first seen at Sheriff Hutton, and at Heworth York, and at Wetherby, April 19th. A Wheatear's nest with four eggs and one egg of the Cuckoo was found at Strensall on July 25th, by Mr. F. Vear.
 Wheatears seen at Copmanthorpe, and several at Sandburn, May 15th.
 „ 23.—Stonechat first seen at Levisham.
 „ 30.—Garden Warbler and Grasshopper Warbler first seen at Sandburn.
 „ 30.—Whinchat first seen at Sandburn. Numerous at Strensall on July 25th.
 „ 30.—Two Sedgewarblers seen at Strensall.
 „ 30.—A pair of Pied Flycatchers seen in a garden at Acomb, York. These birds stayed until August, but we have no evidence of their having bred.
 May 1.—Several Swifts were seen at Heworth. Three at Dunnington, May 6th.
 „ 2.—Turtle Dove arrived at Heworth, York. Two more seen at Dunnington, May 17th, a nest of eggs at Dunnington, July 11th, and a nest with young just hatched at Ampleforth, June 26th. A nest with young at Barmby Moor on July 25th.
 „ 8.—A large party of Swifts arrived at a favourite nesting house on Huntington Road, York, and a party of Swifts on The Mount, York, May 7th.
 „ 10.—Landrail first heard at Murton, and one at Earswick on May 11th.
 „ 17.—Nightjar first seen at Dunnington, and their nest and eggs was found on June 11th.
 „ 17.—Several nests of Snipe and several nests of Redshank, all with eggs, at East Cottingwith.
 June 7.—Six nests of the Reed Bunting, each with five eggs, were seen at East Cottingwith.
 „ 18.—Four young Curlews seen on Strensall Common.
 July 5.—A Redstarts nest, with five young ones, and another with four young ones, were found in Duncombe Park.
 „ 11.—A pair of Reed Warblers seen on the Canal Bank at Pocklington.
 Oct. 13.—House Martin still feeding young in the nest at Dringhouses, York.
 „ 15.—A Jay was picked up in a garden at 8 Portland Street, York, evidently it had been stunned by collision with telegraph wires and recovered after attention.

I am greatly indebted to Mr. V. G. F. Zimmermann, of the York Naturalist's Society, for many valuable notes that are included in this report.

MAMMALS, AMPHIBIANS, REPTILES AND FISHES COMMITTEE.

Mammals (Sydney H. Smith) :—

- Oct. 8th, 1921.—Badgers near Scarborough. See *The Naturalist*, Jan., 1922, page 18, report by Mr. W. J. Clarke. In the York District Badgers maintain their usual numbers in all their local haunts.
- Dec. 24th, 1921.—Stoat in the ermine or winter fur. See *tom. cit.*, Feb., 1922, page 26, report by Mr. C. F. Procter.
- April 17th, 1922.—When fishing the River Dove, near Salton, Yorks., I saw a Weasel deliberately enter the water (which was in slight flood) and swim to the opposite side.
- June 11th, 1922.—I saw a large Stoat chase a brown rat into the River Rye at Salton, and boldly following the rat into the water, it killed it in the rapid stream, but was compelled to abandon its quarry or be drowned along with it. The Stoat ultimately quested the bank in a vain search for the dead rat, which had been washed away down stream. I was greatly surprised by the relentless perseverance of the Stoat after it had been within an ace of drowning as the result of its own ferocious savagery.
- July 22nd, 1922.—Seal. One entered Scarborough Harbour, but escaped to sea again. (*Vide Yorkshire Evening Press*, July 25th, 1922.)
- July 24th, 1922.—A young Seal, a few days old, and unable to feed itself, was caught in Scarborough South Bay, and recorded by Mr. W. J. Clarke.
- Aug., 1922.—Long-tailed Field Mouse. Report on the nest building of this species by Mr. Riley Fortune, *The Naturalist*, Aug., 1922, page 300.
- Sept. 18th, 1922.—A pair of Otters was disporting in the River Foss at York, directly behind my house on Huntington Road, and I saw and heard them for about a month later, when they departed at their own will. I hear that one adult Otter and three cubs were killed at Huntington, three miles from York, early in September, but this was before the above note.
- A White-beaked Dolphin was noted near Scarborough during Easter, 1919, and reported by Mr. E. Percival (*The Naturalist*, June, 1922, page 200).

West Riding (H. B. Booth) :—Badgers are increasing and extending in Upper Wharfedale. It is not many years since they reached Kettlewell, and now there is a fairly large and thriving colony in Firth Wood, above Starbottan.

On the other hand the English Squirrel still continues to decrease, until it is now almost a rarity in many districts where twenty years ago it was common.

In spite of the poll tax offered by the Craven farmers, Foxes are common and even increasing in the Skipton, Malham, and Settle districts. The Rabbit industry is thriving in Craven (where the Rabbits are chiefly 'snickled'), and there is a local saying, 'More rabbits, more foxes.'

A White Stoat, killed on Scale Farm, Rylstone, on August 7th, and described by Lt.-Col. W. W. Maude in *The Yorkshire Post* as in full winter coat, proved on enquiry to be an albino.

Pisces (Sydney H. Smith) :—

Trout.—One of 5½ lbs. reported from Hewick Bridge, Ripon, Jan. 7th, 1922, by Mr. Riley Fortune, (*The Naturalist*, Feb., 1922, page 76). One of 4 lbs. 1 oz. caught on a No. 14 hook at Clifton Ings, York, River Ouse, on June 29th, 1922. One of 4 lbs. 12 oz. caught with a live roach as bait on pike tackle, on Aug. 25th, 1922, at Clifton Scope, York, River Ouse.

Pike.—One of 24 lbs. caught in the River Ure at Middleham, reported by Mr. Riley Fortune (*The Naturalist*, May, 1922, page 148).

Chub.—One of 5 lbs. 3¼ oz. was caught in the River Derwent, near Thicket Priory, on September 28th, 1922. One of 5 lbs. was caught in the River Nidd at Skip Bridge on June 15th, 1922.

Barbel.—One of 8 lbs. was caught in the River Nidd at Moor Monkton on June 18th, 1922.

Bream.—One of 5 lbs. was caught in the River Derwent, near Whel-drake, during August, 1922, and another one, 4 lbs. 1 oz., was caught at Sutton-on-Derwent, in the River Derwent, on Sept. 18th, 1922.

Roach.—One weighing 1 lb. 12 oz. was caught near Fulford, York, in the River Ouse, in February, 1922. One of 1 lb. 9½ oz. was caught at Clifton Ferry, York, in the River Ouse, on June 29th, 1922 (W. Kershaw), and one of 1 lb. 6 oz. was caught in the River Ouse on the New Walk, York, on July 11th, 1922 (H. Coning).

Bonito.—Caught at Whitby, Aug. 22nd, 1922 (F. Snowden, *The Naturalist*, October, 1922, page 314). Mr. W. J. Clarke states that the precise species was not ascertained.

Flounder.—One of 1 lb. weight was caught in the River Derwent, near Thicket Priory, on Sept. 28th, 1922.

North Sea (W. J. Clarke) :—

Sturgeon.—One 4 feet in length was landed by a Scarborough trawler on February 1st, 1922 ; another small one was brought in on March 11th.

Short Sunfish.—One small one was captured in the herring nets at Scarborough on August 3rd, 1922.

Halibut.—Two large Halibuts, one weighing 10 stones, and the other 12 stones, were landed at Scarborough on August 9th, 1922.

Basse.—One weighing 5 lbs. was caught from the shore at Scarborough on August 27th, 1922.

Porbeagle Shark.—Several were taken in the herring nets near Scarborough during the summer, and one became stranded in shallow water at Carnelian Bay, near Scarborough, on August 27th, 1922.

Northern Chimaera.—One was taken in the trawl, 160 miles North of Scarborough, on October 16th. (This is not in the North Riding, but is an important record for the North Sea.)

Banks's Oar-fish.—A Banks's Oar-fish, 3 ft. long, was brought into the Hull fish market by a trawler early in November, and illustrated in the *Hull Daily Mail* of November 7th, 1922.—T.S.

Wharfe (H. B. Booth) :—A monster River Trout was found dead by the River Wharfe, just above Starbotten, near Kettlewell (*The Naturalist*, 1922, page 301.) The few Eels that inhabit the upper reaches of the Wharfe are usually small, but Mr. Rosse Butterfield informs me that one caught near Grassington, on June 11th, measured 2 feet 7 inches.

Reptiles.—At the Fungus Foray of the Yorkshire Naturalists' Union, October 3rd, Mr. A. E. Peck caught a Slow-Worm just above Buckden.

WILD BIRDS AND EGGS PROTECTION COMMITTEE.

Mr. F. H. Edmondson reports :—

The Breeding Season, 1922, on the whole has been fairly satisfactory. The migrants arrived very erratically, and on the average about a fortnight late. Some districts have numerous Swallows, and some are practically without, the same applies to the Landrail, but on a very much reduced scale.

The Peregrine Falcon in North West Yorkshire.—I have every reason to believe that two pairs reared their young ones successfully, the pair that the Society protect specially, reared two young.

The old pair at Bempton have not bred, there are the usual reports of them being seen about. Two birds were shot along the Yorkshire Coast last winter. Blasting the wreck near the old eyrie still continues, which may have something to do with their not breeding.

Stone Curlews, North Riding.—Two pairs have bred and reared their young ones. I think they are extending their ground northward. I got partly in touch with the keeper of the adjoining estate, and next year I think we shall have his cooperation. A pair or two have probably bred this year on his land. I think the Stone Curlews are slowly decreasing in spite of the protection we can give them.

East Riding.—When I visited the district at the end of May, I did not see any birds ; later I had a report that two pairs had bred.

Spurn.—Lesser Tern on the Spurn arrived at the end of May in very much reduced numbers. About 25 pairs breeding near the Beacon, and 30 to 40 pairs on Spurn, have successfully reared their young.

Ring Plovers are very numerous, and have in many cases reared two broods. A pair of Sandwich Tern has been about this season, but the eggs were not found. (Magpies have been rather troublesome this year.)

Hornsea Mere.—The expense for Hornsea Mere has been much greater than usual ; at one time it looked as if we were going to be without a watcher ; however, owing to Mr. Wade's energy and Mr. St. Quintin's generosity and the help of a few more friends, we have been able to get a man as watcher. It is pleasing to know that the owner reports that it has never previously been so well protected and so quiet.

Several pairs of Crested Grebe, Pochard, Mallard and Tufted Duck have bred. Sedge Warbler and Reed Warbler were in good numbers, but I could not see or hear the Bearded Tit.

Fulmar Petrel.—The Fulmar Petrel has bred this year at Speeton, eggs were taken on May 26th. It is reported that 5 eggs have been taken and some left to hatch, but two of our members visited the cliffs, and report that they do not think any were left to hatch.

It is proposed to get in touch with the County Council and have this bird's eggs put on to the protected list ; at present the bird is protected but not the eggs.

Green Plover returned to the Breeding Station in the hills rather earlier than usual, the cold wet weather drove them down from the high land. Those breeding in the higher land had their eggs spoilt by the frost. Those breeding in the lower land have done well.

The Dunlin has bred this year in another area in West Yorkshire.

Merlin in North Yorkshire.—I am very sorry to report that after considerable correspondence nothing satisfactory has been done. One thing I require is the definite name of the owner, and the exact situation of their breeding place. At present it seems to be mixed up with two or three people.

Merlin in the West Riding.—I have interviewed the keeper concerned, and Mr. St. Quintin has been in communication with the Duke of Devonshire, with the result that this year two or three pairs have reared their young, which is very satisfactory.

On the borders between Lancashire and Yorkshire they have done reasonably well.

I have personally seen all our Watchers, and they give a fairly satisfactory report.

BALANCE SHEET.

RECEIPTS.	£	s.	d.	PAYMENTS.	£	s.	d.
Balance brought forward	9	7	5	Mr. W. Medcalf ...	18	7	6
Mr. Albert Hirst ...	5	0	0	Mr. W. O. Lewis ...	0	15	0
Mr. W. H. St. Quintin ...	5	0	0	Mr. J. Green ...	3	0	0
Mr. J. W. Dent ...	2	2	0	Mr. J. Hodgson ...	20	0	0
Mr. L. Gaunt ...	2	2	0	Mrs. Capstick ...	2	0	0
Mr. J. Atkinson ...	1	1	0	Balance in Bank ...	9	10	3
Mrs. Bishop ...	1	1	0				
Mr. H. B. Booth ...	1	1	0				
Mr. B. Lipscomb ...	1	1	0				
Mr. Chas. O. F. Saner ...	1	1	0				
Mr. J. Wilkinson ...	1	1	0				
Mr. F. H. Edmondson ...	1	0	0				
Miss Waterhouse ...	1	0	0				
Mr. H. J. Behrens ...	0	10	6				
Mr. W. N. Cheesman ...	0	10	6				
Mr. E. B. Gibson ...	0	10	6				
Mr. T. Haxby ...	0	10	6				
Mr. J. F. Musham ...	0	10	6				
Mr. W. H. Parkin ...	0	10	6				
Mr. S. H. Smith ...	0	10	6				
Mr. E. W. Wade (1921) ...	0	10	6				
Mr. E. W. Wade (1922) ...	0	10	6				
Mr. W. G. Bramley ...	0	10	0				
Mr. R. Chislett ...	0	10	0				
Mr. J. Y. Granger ...	0	10	0				
Mr. A. H. Lumby ...	0	10	0				
Mr. C. F. Procter ...	0	10	0				
Mr. G. T. Porritt ...	0	10	0				
Mr. H. E. Wroot ...	0	10	0				
Mr. E. Cockshaw ...	0	5	0				
Mr. G. Fysher ...	0	5	0				
Mr. W. Mason ...	0	5	0				
Mr. E. W. Taylor ...	0	5	0				
Refund from Museum	0	5	0				
DONATIONS							
Mr. W. H. St. Quintin	5	0	0				
Mr. J. Wilkinson ...	1	1	0				
Mr. F. H. Edmondson	1	0	0				
Collected by Mr.							
Edmondson ...	5	0	0				
Bank Interest ...	0	4	10				
	£53	12	9		£53	12	9

Audited by W. E. L. WATTAM.

F. H. EDMONDSON,
Hon. Secretary.
J. WILKINSON, Treasurer.

CONCHOLOGICAL SECTION.

Mollusca of Elvington-on-Derwent, East Yorkshire (J. F. Musham):—The following species of land and freshwater Mollusca were obtained at the joint meeting of the Leeds Conchological Club,

the Conchological Section of the Yorkshire Naturalists' Union, and the Selby Scientific Society, on June 10th, 1922 :—

<i>Arion ater.</i>	<i>Planorbis carinatus.</i>	<i>Valvata cristata.</i>
<i>Agriolimax agrestis.</i>	<i>P. umbilicatus.</i>	<i>Sphaerium corneum.</i>
<i>Hygromia hispida.</i>	<i>P. vortex.</i>	<i>Pisidium subtruncatum.</i>
<i>Succinea putris.</i>	<i>Physa fontinalis.</i>	<i>P. nitidum.</i>
<i>Limnaea peregra.</i>	<i>Bithynia tentaculata.</i>	<i>P. milium.</i>
<i>L. palustris.</i>	<i>B. leachii.</i>	<i>P. henslowanum.</i>
<i>Planorbis albus.</i>	<i>Valvata piscinalis.</i>	<i>P. casertanum.</i>

Officers for 1923.—*President*, J. H. LUMB, Halifax. *Representative on Executive*, Yorkshire Naturalists' Union, H. L. STEPHENSON, Leeds. *General and West Riding Secretary*, G. FYSCHER, Leeds. *Secretary for North Riding*, J. A. HARGREAVES, Scarborough.

Marine Biology.—The Report of this Committee appears in *The Naturalist* for December.

ENTOMOLOGICAL SECTION.

Coleoptera Committee (W. J. Fordham) :—Reports from all parts of the county indicate that the past season has been a poor one for beetles. Several interesting observations have been made, however, which extend the known distribution in the county of various species. Two new species may be added definitely to our list. *Myllaena dubia* Gr. from Chandler's Whin (*The Naturalist*, 1922, p. 328) and *Limnebius papposus* Muls. from Escrick, near York. Full details are not yet to hand for the complete list, which it is hoped to publish later.

Hemiptera (J. M. Brown) :—The year 1922 has not been very favourable for collecting Hemiptera. The weather, during the months when the Heteroptera, at any rate, are usually most abundant, was distinctly wet, making sweeping for delicate insects difficult. Apart from this interference with collecting, the season seems to have affected some species adversely, e.g., perhaps the most generally common species of Heteroptera swept from grass and low vegetation in my own neighbourhood is *Miris holsatus*. At ordinary times it occurs in great numbers during the summer. This year I have come across very few indeed. *Nabis limbatus*, another species generally occurring in profusion, was rarely met with. The Homoptera do not seem to have been greatly affected.

Much material has been obtained, especially in the neighbourhood of Sheffield and Bridlington. When this has been completely worked through, I shall be able to add probably a dozen Heteroptera and double this number of Homoptera to the Yorkshire list. Hemiptera were collected on one excursion of the Yorkshire Naturalists' Union, viz., at Askham Bog, when four species of Homoptera new to the county were obtained.

Among the Heteroptera which I have collected since Dr. Fordham's list was prepared, the most interesting are *Coreus denticulatus* and *Calocoris infusus* from Sheffield, *Calocoris lineolatus*, *Macrotylus solitarius* and *Phylus coryli* from Bridlington (where I also got *Lygus rubricatus* and *Macrotylus paykulli*), and among the Homoptera, *Agallia venosa*, several species of the genera *Deltocephalus*, *Limotettix*, *Typhlocyba*, *Zygina* and a number of *Psyllids*.

Another noteworthy find was a macropterous male of *Nabis limbatus* at Wharnccliffe.

Mr. G. B. Walsh has supplied a list of captures, including *Drymus brunneus*, *Nysius thymi*, *Stygnus pedestris*, *Harpocera thoracica* and *Cyrtorrhinus flaveolus* from Hull, which last is new to the county.

Complete lists are being prepared for *The Naturalist*.

The published lists indicate two things, first, that the smaller Homoptera have been much neglected, and, second, that Hemiptera have been collected in very few spots in the county. I should be glad to receive records or specimens of even the most common species from any part of Yorkshire.

Neuroptera and Trichoptera (G. T. Porritt) :—Mr. H. M. Stuart sent me specimens of *Hemerobius concinnus* from Everingham, a species for which we had previously only two localities in the county, and only single specimens in both cases. With them he sent *Hemerobius quadrifasciatus*, a species which was mixed up with *concinnus* for many years. The Rev. Cyril Ash sent me *Chrysopa phyllochroma* and *Raphidia xanthostigma*, also from Everingham; all were taken in July. The only Trichopteron of interest I have seen was *Ecclisopteryx guttulata*, which I found on the stream at the bottom of Royd Edge, Meltham. It is abundant enough in the county, but although it had been recorded by the late Mr. Alfred Beaumont so long ago as 1865 as common in the Huddersfield district, I had always failed to find it until last June, when it occurred at probably the same place in which Mr. Beaumont used to take it, as he resided in the immediate district. I also got *Sialis fuliginosa* at the same time and place.

Diptera (Chris. A. Cheetham) :—Interest in this group still grows, and the number of workers steadily increases.

About 100 species will be added to the Yorkshire list as a result of the year's work. Twenty of these are due to the efforts of the Galls Committee. Five species are additions to the British list, viz., *Exechia confinis* Winn., *Ptychoptera longicauda* Tonn., *Molophilus corniger* de Meij., *Leria biseta* Lw., and *Eurygnathomyia opomyzina* Zett. Other interesting captures are: Mr. W. J. Fordham's *Physocephala rufipes*, *Lasiopogon cinctus* and *Epitriptus cingulatus*, all from Allertorpe Common. Mr. Geo. Grace had *Ornithomyia avicularia* and *Platypeza infumata* from Ilkley. Miss M. A. Mellish, a female *Ctenophora pectinicornis* from Nidd. Mr. W. Falconer *Anthomyza gracilis* from galls of *Lipara lucens* at Askham Bog.

Taken as a whole the season has been disappointing, the only group which has done well, as Mr. F. W. Edwards points out, is the fungus gnat family (Mycetophilidæ), this being due to the abundance of fungi, and it is interesting in view of the scarcity of these flies last year owing to the drought. Some other species which have been more plentiful than usual are *Conops flavipes*, *Sicus ferrugineus* and *Dioctria rufipes*, whereas a common syrphid like *Syrphus balteatus* has been quite scarce. Mr. J. H. Ashworth found Chironomids frequent in Airedale after the heavy floods, and he noted the scarcity of Dung flies and also the high percentage of Syrphids in the few Diptera seen on excursions in the East Riding during the British Association meeting.

Hymenoptera (Rosse Butterfield) :—Mr. D. W. Bevan obtained *Megachile ligniseca* Kirb., an addition to the Aculeata near Scarborough. Information as to the Hymenopterous fauna of the Yorkshire coast and the East Riding generally is needed. The rainfall is lower, and the amount of sunshine is greater than in the West and North Ridings, and if thoroughly investigated, should prove by far the richest of the three.

Mr. A. E. Bradley has again paid attention to the varieties and species of the genus *Bombus* in the Roundhay neighbourhood. A black variety of the male *B. ruderatus* occurred on the flowers of Betony in August. No queens or males of *B. derhamellus*, nor have either sex or workers of *B. soroensis* been seen this season, although the species was common last year. This raises the question of migration or distribution of *Bombi* when conditions are favourable as last year. Of the inquilines of *Bombus*, varieties of *Psithyrus campestris*, *leeanus*, *franciscanus* and *rossiellus* were all taken, and a variety of the male of *P. quadricolor*,

entirely black except at the extreme apex of the abdomen, Roundhay. This variety is apparently unrecorded. *Mellinus arvensis* has not been seen at Roundhay, but among the captures last year, one of three females shows four strong broad bands on the abdomen. Mention is made of a large colony at Woodhall Bridge, near Collingham, which Mr. Bradley has known for years.

In August, Mr. W. J. Fordham captured at Allertorpe Common females of *Myrmosa melanocephala* in a sand pit, and also *Mellinus arvensis* and *Ammophila sabulosa*. He suggests that the common would prove a good place for detailed investigation, and would be fruitful in Aculeates.

During the warm weather in May various species of *Andrena* and *Nomada* were fairly common on the sandy moor slopes of the West Riding. Early in May I took what is probably an example of *Andrena varians*.

Ichneumons and Saw-flies have not received much attention. Of economic interest, Mr. C. A. Cheetham mentions *Theocolax formiciformis*, parasitic on *Anobium* from a bobbin of yarn, Stone Bridge Mills, Wortley. There is reason to think that this parasite is widely distributed in worsted mills. Old wicker yarn baskets or skeps provide suitable material for the larvæ of *Anobium*.

On August 13th, Mr. Fordham captured *Emphytus calceatus* on Allertorpe Common.

Lepidoptera (B. Morley) :—The cold wet season has had an adverse effect on lepidoptera generally, and few species have appeared commonly. Sugar was only moderately attractive during the summer, but with the advent of September at Skelmanthorpe at least it gave much better results. Flowers have been disappointing, owing probably to their inability to develop nectar through lack of sunshine. A curious result of the wet and cold has been the extraordinary length of time over which the emergence of some species extended. At Skelmanthorpe *Hadena polyodon* and *Melanchra pronuba* continued to emerge from June to October, when perfectly fresh specimens of both, and also of *Leucania lithargyrea* and *Metachrostis perla*, were seen. *Epiblema brunnichiana* also occurred commonly amongst coltsfoot from early June to late August. Mr. Porritt found *Plemyria galiata* still out at Royds Edge on September 7th, and the Rev. C. D. Ash took *Panolis piniperda* in fresh condition at Sandburn on May 30th.

The two migratory species which have been in special evidence almost throughout England, *Colias croceus* and *Sphinx convolvuli*, have both visited the county, *vide* the records in *The Naturalist* for October, and, in addition, a specimen of the former species was taken, and two more were seen by Mr. F. Rhodes on Linton Common, Collingham, on August 25th.

At Saxton, Tadcaster, Mr. Ash has added *Deilephila elpenor*, *Habrosyne detersa* and *Cucullia verbasci* to the local list, he also states that the percentage of melanic examples of *Hadena polyodon* was exceptionally large. He has again taken *Nonagria arundineta* in the Wharfe valley. Mr. G. F. Musham reports that a larva of *Acronycta alni* occurred at Selby on September 25th, and Dr. H. D. Smart has added *Carpocapsa pomonella* to the Shelley list. Mr. G. T. Porritt reports *Euchloe cardamines* common near Emley in June, and a more than usual number of larvæ of *Lasiocampa quercus* on Royd Edge moors, Huddersfield, where for many years it has been very scarce. At Huddersfield larvæ of *Abraxas grossulariata* were for the third year in succession very scarce, of the few wild moths seen one was a worn example of the variety *Varleyata*. The moths he bred from the *Harmodia carpophaga* larvæ alluded to in last year's report were near the usual inland form but darker. He has also taken *Polia aprilina* variety *virgate* in Whitley Lower Wood, Mirfield, a new locality for the species. From a female *Xanthorhoe fluctuata*, taken

locally last year, he has bred a fine series of the variety *incanata*, the darkest he has ever seen. He found *Scoparia angustea* common at Meltham, at which place also, and at Huddersfield, he took *Crambus inquinatellus*, a little known species locally.

Mr. T. H. Fisher took *Phalonia badiana* in August and *Chilidonia baumanniana* in June at Skelmanthorpe, the latter being new to the local list. In Deffer Wood, in early October, Mr. W. Buckley took a long series of fine and very dark *Polia protea*, a scarce species in the South-west Riding, and also at the same place an almost black example of *P. aprilina*.

The following refers only to my observations made in the Skelmanthorpe district. *Eois inornata* has been common and has occurred in various woods in the district, whereas previously it was only known as scarce in Deffer Wood. *Acompsia subaquilea* was common in June, *Tinea corticella* and *T. semifulvella* occurred in July, and *Acalla aspersana* was abundant in August. The following have been taken for the first time in the district: *Tischeria marginea* and *Lithocolletis roboris* in May, *L. salicicolella*, *Chrysoclista atra*, *Epiblema tedella* and *Plutella porrectella* in June, *Eois dimidiata*, *Eucosma sororculana* and *Aristotelia tenebrella* in July, and *Ancylis sicilana*, *Scoparia angustea* and *Argyresthia mendica* in August. *Acompsia flavifrontella* was taken in June, hitherto not known for the county south of Scarborough. In September, *Cerostoma alpella* was beaten from oak in Deffer Wood, the only previous county record being from near York.

Other notes on lepidoptera appeared in *The Naturalist* for October.

Arachnida (W. Falconer):—Members of the Committee have attended various meetings during the year, but, owing to the claims of other pursuits, were not able to take full advantage of their opportunities. The little that was done in this way was reported in *The Naturalist* accounts of the meetings held at Bingley (July issue), and at Askham Bog (October issue). The most notable species obtained at the former locality were *Theonoe minutissima* Cb. and *Centromerus arcanus* Ch. Goitstock, V.C. 63.

Consignments for identification or verification were received from Messrs. T. Stainforth, W. P. Winter and A. Smith. Having, however, in many instances been collected before the present year, the more important of them were entered, where possible, in the Supplement mentioned below. One, *Singa pygmaea* Sund., is an addition to the county list, increasing the total number of species to 323. Mr. Stainforth's captures, not otherwise recorded, include V.C. 61 *Amaurobius ferox* Walck. from Hotham Carrs, N. Cave; *Leptyphantes nebulosus* Sund., from Pearson Park, Hull, and *Epeira cornuta* Clerck. from Houghton Woods. Mr. Winter states that *Drassus lapidosus* Walck. seems to occur in the vicinity of Bradford only at Hope Hill, Baildon, V.C. 64. He obtained the following from Sunnysdale, near Bingley, V.C. 64, *Evansia merens* Cb. (at large), *Ceratinella brevis* Wid., *Theridion sisypium* Clerck. and *Tetragnatha solandrii* Scop., for the last three of which more records are needed for the more hilly western portions of the county; also V.C. 65 *Peponocranium ludicrum* Cb. from Waldendale. In the Huddersfield district, V.C. 63, *Typhochrestus digitatus* Cb. and *Micryphantes gulosus* Koch., are still to be found on Crosland Moor, and *Epeira cucurbitina* Clerck. turned up in both Deffer Wood and Cawthorn churchyard, one of the last being without the characteristic red blotch behind. In Dalton Lane, near Collingham, V.C. 64, *Clubiona pallidula* Clerck., which has few Yorkshire notices, occurred spun up in leaves, with two other commoner species.

Nothing of importance cropped up in the other orders, except that the false-scorpion, *Chthonius tetrachelatus* Preyss, was sent in by Mr. J. M. Brown from the Sheffield district, while eight gall-mites are specially noted in the Plant Gall report.

The 'Spiders of Yorkshire,' commenced in June, 1918, reached its

conclusion in the July *Naturalist*, and was brought up to the end of 1921 by means of a Supplement published in October and December. It will be followed by the 'Mites of Yorkshire,' which will complete the enumeration of the four orders of the Arachnida found in the county.

A paper on 'The Arachnida of the East Riding' was contributed to the British Association Handbook, and a case, to illustrate the harvestmen and false-scorpions of Yorkshire, was prepared for the Yorkshire Naturalists' Union's Exhibition held at Hull in September.

BOTANICAL SECTION.

General Report (C. A. Cheetham and J. Fraser Robinson) :—The past year has been a very busy one for botanists of all branches, both indoors and in the field. At the last Annual Meeting of the Botanical Section, so much of interest cropped up that it was decided to hold further meetings during the year. These have duly taken place, namely, one on February 11th, at Leeds University, and the field meeting at Middleham and East Whitton in June last. Points full of botanical interest invoking useful discussion arose at these meetings and have been fully reported in *The Naturalist*. Prof. Priestley's and Dr. Pearsall's work on the physiological side is, perhaps, more intimately connected with the Union's peat investigation; but this and other knowledge of local work shows that botany generally is well up on a rising curve in Yorkshire, as in many other centres. Notes from all quarters of our big county show that, while on the whole sunshine has been comparatively deficient during 1922, with a lowering of average temperature, yet from a floristic point of view this has had distinct advantages. The sunshine and warmth of 1921 prepared undoubtedly for the great blossoming time which obtained in the spring of this year, notably of Hawthorn, and many trees, including the *Prunus* and *Pyrus* genera of the Rosaceæ. It has been said that never before in the memory of man was there such a show of Hawthorn or Pear blossom as was the case in spring of 1922. Moreover (and this is by no means always the case), thanks to the fine frostless weeks of May and June last, the promise of spring has been abundantly fulfilled in the fruitage of autumn. The consensus of opinion respecting the crop of fruit on Mountain Ash, Hawthorn, the Prunes (Sloe, Bullace and Plum; but not the Wild Cherry), Guelder-rose, White-beam, Sycamore, Ash, Beech and Hazel seems to be that a record has been established in each case. The apple, both wild and domesticated, must, we fancy, be put down as only normal or a good average in both East and West Riding districts, whilst the oak in most cases is pretty much the same. Generalisation in the matter of the fruit crop must not be too sweeping, inasmuch the crop certainly varies with the district, and even with trees in the same district. Most of the richly foliaged oak trees in the East Riding are, this year, we think, rather poorly fruited. On the other hand, trees have come under observation quite recently whose foliage is poor, dry and shrivelled looking, but with acorns most prolific. In some districts the fruits of the bramble are abundant, but not ripening well; in others, as in the East Riding, the crop seems much below par. Probably the rains and lack of sunshine which coincided with the normal flowering time of the Rubi may be partially responsible for this.

As usual, or perhaps more than usual, the 'floristic' side has had great attention from the local societies or individual members of the Union, with the result that several new plants or new stations have been added to the flora of certain areas, vice-counties, etc. Notably amongst these are *Lathyrus palustris* (Marsh Pea), *Inula Conyza*, *Centunculus minimus*, *Symphytum tuberosum*, a hybrid *Viola*—*V. hirta* × *V. orodata*—for the East Riding; and a Broom-rape (? *Orobanche elatior*) and *Cirsium pratense* Druce (Meadow Thistle), which, we suppose, is the *Cirsium britannicum* Scop. of the Ellerburn Marsh (*vide* Report of Meeting in

The Naturalist for August-September, 1922) for the N.E. Vice-county of Yorks. The Report just referred to is one of the very best, and is from the pens of Dr. W. H. Pearsall and Mr. F. A. Mason, with other collaborateurs. It is a clear, full and exhaustive contribution, alike valuable to the ecologist and systematist, whether he be cryptogamist or phanerogamist—another proof, we think, of the ascending curve.

However much work may have gone on in plant study in the field and in camera before the recent Meeting of the British Association in Hull, and that work, as had been already hinted, was large in amount, there can be no doubt that it was brought to a focus in Section K (Botany), in which Yorkshire botanists took so notable a part, and the impetus that the Association has given to botanical study in all ways is very real indeed, and will, we feel sure, be lasting in its effects. In this connection it is appropriate to record that one of your secretaries, who was also Hon. Local Secretary of the aforesaid Section K, had been almost overwhelmed with kindly expressions of appreciation and gratitude for (1) the fine Exhibition of the Natural Resources of Yorkshire, and the work (including Survey) of the local Societies which the Yorkshire Naturalists' Union had arranged specially for the B.A. Meeting, and (2) for the opportunities both for work and enjoyment that were afforded by the three Excursions into the East Riding districts which were planned and carried out on Yorkshire Naturalist Union lines. These excursions were respectively to Welwick (Saltmarsh) and Spurn (Sand dunes), to Elloughton and Brantingham Dales in the Chalk Wolds, and to Skipwith and Riccall Commons on the great sandy tract of East Derwentland; and all were well attended by carriers of vascula.

It is with great regret that the loss by death of an enthusiastic and notable botanical colleague has to be recorded, for Rev. E. A. Woodruffe Peacock, F.L.S., F.G.S., of Grayingham Rectory, Lincolnshire, passed over to the 'Great Majority' on 3rd February last.

Botanical Survey Committee (W. H. Pearsall) :—The Whitsuntide excursion at Thornton Dale proved singularly interesting from an ecological point of view, and the full lists of fungi and of lichens compiled by Mr. Mason and Mr. Wattam respectively, in the main plant communities seen, mark a valuable development of the Committee's work. It is to be hoped that further co-operation of this type will be possible.

The Middleham excursion in June served to emphasize the distinctness of the Yorkshire gill woods on limestone, with Elm as the dominant tree, from other types of Woodland recognised in this country. A study of these woods would prove very acceptable to British ecologists in general.

The relative paucity of the flora in the Yoredale gills, as compared with those on Mountain Limestone, was also noted, and attributed to the smaller percentages of lime in the former rocks.

An interesting addition to both of the excursions mentioned was the inspection of the areas under afforestation. The rapid spreading of larch on to heather moor at Middleham was an especially interesting and unusual feature.

Finally, no account of the Committee work would be complete without a reference to the magnificent exhibition at the British Association of Maps by Dr. Woodhead and Dr. Smith, illustrating the survey of the Huddersfield district and of Yorkshire generally. It may safely be said that such a mass of data is unrivalled in the British Isles.

Bryological Committee (W. H. Burrell) : A pressing need of the nineteenth century was the working out of the relative frequency of plants. Now that the County floras have been published, this need is less insistent and at first sight it might be thought that field bryology is under a cloud; we should admittedly find it difficult to match the able and enthusiastic men who worked the county so industriously, whose names will be handed down to posterity, but a review of the passing year en-

courages one to believe the work is not suffering from neglect ; there is increasing recognition that a good field knowledge of mosses has a value in ecological studies, for reading soil characters, and this new direction of progress is likely to open out problems in physiology and attract new workers. The subject of oil bodies, and the significance of soluble and insoluble soaps in plant economy have been ventilated in *The Naturalist*, and have developed a new field of thought. For those who want a cue for the useful outlet of surplus energy, it may be mentioned that the Sphagna have not been exhaustively worked in Yorkshire and, further, that Mr. Wheldon's key to the Harpidioid Hypna, published in *The Naturalist*, gives a lead to the intensive study of another critical group ; here are subjects sufficiently difficult to be worth attempting by a dozen students in different districts who could give each other mutual aid. Three new vice-county records have to be reported, *Myurella julacea*, found by Mr. Cheetham in Bishopdale, August, 1922 ; *Orthodontium gracile* and *Moerckia Flotowiana*. A few records which have not fallen within the scope of excursion reports need a brief reference in the Society's journal :—

Oligotrichum hercynicum. Raikes Dyke, Holme ; V.C. 63.

Dicranum scoparium var. *spadiceum*. Greensett Moss, Whernside ; V.C. 64.

Tortula marginata. Mount Grace Priory ; V.C. 62.

Aulacomnium palustre with malformed leaves. Greensett Moss and Austwick Moss, V.C. 64. The galling of mosses and liverworts by nematode worms is referred to by Monkemeyer and Macvicar ; it is probable that the malformation now noted is due to a similar cause, but this was not definitely determined.

Breutelia arcuata. Carpeting the fell road leading from Great Wold, Whernside to Dent, C.A.C., August, 1922, V.C. 65.

Orthodontium gracile. Raikes Dyke, Holme ; V.C. 63, May, 1922, fide J. A. Wheldon on moorland soil and base of old Birch trees, 900 feet. In the *Journal of Botany*, 1922, p. 140, a new variety, 'heterocarpha' is described by Dr. Watson, gathered at Crowden, Cheshire, and on the Yorkshire side of the Pennines. The Holme gathering is from the district referred to, and appears to belong to the variety which is distinguished by its asymmetrical capsule.

Fontinalis antipyretica var. *gracilis*. Force Gill, Whernside and the Nidd at Birstwith. V.C. 64.

Hypnum P. tientiae. Grassy fell roads, Widdale Fell, V.C. 65 ; Oughtershaw Fells, V.C. 64.

Moerckia Flotowiana. Force Gill, Whernside, V.C. 64 ; 1250 feet ; fide H. H. Knight, August, 1922.

Nowellia curvifolia ; in quantity, fruiting, both on decaying wood and on gritstone. Valley of Desolation, Bolton Abbey, V.C. 64.

Bazzania trilobata. Hazelwood Moor, Bolton Abbey, V.C. 64, 800 feet.

Scopania dentata var. *speciosa*. Heyshaw Moor, Dacre ; V.C. 64.

S. umbrosa. Plentiful on grit rocks, Valley of Desolation, V.C. 64.

Microlejeunea ulicina. Valley of Desolation, F. Milsom, V.C. 64.

In Britain *Moerckia Flotowiana* usually occurs on low ground near the coast ; there appears to be no previous British record for it at so high an elevation ; Müller, however, says it is widely distributed in Europe, both in the hills and lowlands, and stations are named up to 1200 metres altitude.

Plant Gali Committee (Mr. W. Falconer) :—Two successful meetings for field work have been held during the year, viz., at Askham Bog, in conjunction with the Entomological Section, in June, and in the district between Thorner and Collingham in August. They were the means of adding *Oligotrophus corni* Gir. to the fauna of the North of England, and *Rhodites spinosissima* Gir., *Perrisia praticola* Kieff., *P. inclusa* Frauenfl., and both sexes of a dipteron, *Anthomyza gracilis* Fln., bred

from galls of *Lipara lucens* Mgn., to that of Yorkshire. The gall of the rare moth, *Nepticula argyropeza* Zell., received its first specific mention for the county, for which also *Perrisia malphigii* Kieff. and *P. acer crispans* Kieff. are second occurrences. Full accounts of the meetings appeared in *The Naturalist* for October and December. On February 2nd, at a meeting of the Botanical Section at Leeds University, Mr. T. H. Taylor showed living examples of the rotifer, *Notommata wernecki* Ehrenb., and its elongated gall on a species of *Vaucheria*, but the origin of the water-cress with which the alga was entangled was unknown.

At the Annual Meeting of the same Section on October 7th, Mr. W. H. Burrell exhibited leaf deformations of the moss, *Aulacomnium palustre* Schwgr. from Greensett Moss, Whernside, V.C. 64, gathered in August at an elevation of 1950 feet, which might be the work of eelworms, *Tylenchus* spec. Galls due to these are said by Houard to occur on two British mosses, but, as in this case, no eelworms were seen, it is not now put forward as an undoubted record, but is alluded to to stimulate further search. On September 23rd, near the water fall in Lister Park, I found *Stictodiplosis scrophulariae* Kieff. affecting the flowers of knotted figwort. None of these three has been noticed in Yorkshire before.

A considerable amount of work has been done at other times, and the results obtained recorded in *The Naturalist* in various articles and noted, the one by Mr. H. J. Burkill being of particular value. The following is the list :—

January.—Additions to the Plant Galls of Scarborough.

February.—Meeting of the Botanical Section at Leeds.

April.—Plant Galls from Selby and York.

May.—In List of Yorkshire Homoptera (W. J. Fordham). Although no definite mention of their galls is made, five of the species of Psyllidae named are recognised agents.

June.—Plant Galls observed at Scarborough in 1921 (H. J. Burkill).

July.—In Yorkshire Naturalists at Bingley.

August-September.—*Lipara lucens* Mgn. at Strensall Common (F. A. Mason); Yorkshire Naturalists at Thornton Dale, Reports on Mycology and Economic Biology (F. A. Mason).

October.—More Plant Galls from the Leeds District.

December.—Plant Galls, Thorner to Collingham.

Mr. W. P. Winter has also supplied MSS. lists of forms collected by himself and others in the Bradford district, amongst which was *Trioza aegopodii* F. Löw, Tower Road, Saltaire.

A chapter on the Plant Galls of East Yorkshire was contributed to the British Association Handbook, and cases shown at the Yorkshire Naturalists' Union's Exhibition held at Hull, to illustrate their economic importance and their utility as a scientific field study.

As some more recent finds have lately received prior publication to my own discoveries of three or four years' standing, it seems advisable to place on record the following galls from the Huddersfield area.

I.—NEW TO YORKSHIRE.

HYM. *Aulacidea pilosellae* Kieff. Thurstonland, on *H. pilosella*.

DIP. *Perrisia cerastii* Bin. Varley Road, Slaithwaite, on *Cerastium triviale*.

P. aparines Kieff. In a ditch in a wood between Cawthorn and Hoyland, on goosegrass.

HOM. *Myxoxylus laniger* Hausm. Gunthwaite Hall, on apple trees; near Almondbury, on crab in a garden hedge.

Phorodon galeopsidis Kalt. In a cornfield, during the war, at Holthead, on *Galeopsis tetrahit*.

AC. *Eriophyes atrichus* Nal. Whitley Woods, S. L. Mosley, Farnley Hey, Slaithwaite, Cannon Hall Park, on *Stellaria graminea*.

- Ac. *Eriophyes quercina* Can. On oak and *E. paderineus* Nal., on bird cherry, both Barrett Clough, Slaithwaite.
E. tiliarius Con.—On bract margins of *Tilia europaea*, near Cannon Hall.
E. pilosellae Nal. Slaithwaite, Kirkheaton and Banks Wood, Emley, on *Hieracium Pilosella*.
E. tuberculatus Nal. On the canal bank between Bradley and Mirfield, on tansy.

II.—OTHER RECORDS.

- DIP. *Perrisia ranunculi* Brmi. In a field near Helme Vicarage, on *R. acris*.
P. trailii Kieff. Several places about Slaithwaite, and between Skelmanthorpe and Cawthorn, on *R. acris*. Wilberlee and Barrett Clough, on *R. repens*.
Asphondylia mayeri Lieb. Sun Dean and Lower Butternab Wood, on broom.
Perrisia thomasiana Kieff. Cannon Hall, on *Tilia europaea*.
P. serotina Winn. Fenay Bridge and Kirkburton, on *Hypericum perforatum*.
P. galeobdolonitis Winn. Thunder Bridge and Dogley Lane, on yellow archangel.
P. periclymeni Rübs. Sun Dean, Lepton Great Wood, and Deffer Wood, on common honeysuckle.
P. affinis Kieff. Wilberlee (Slaithwaite), on the Meltham Road at Healey House, and Kirkburton, on *Viola riviniana*. Both forms.
P. stachydis Brmi. Thunder Bridge, two examples on *S. sylvatica*.
P. galii H. Löw. Smithy Brook, Middletown, on *G. verum*, apparently the only Huddersfield locality.
P. trachelii Washtl. Wilberlee and Varley Road, Slaithwaite, and Shroggy Lane, Kirkheaton, on harebell.
Ac. *Eriophyes euaspis* Nal. Emley, on *Lotus uliginosus*.
E. gibbosus Nal. Old Lane leading out of Honley Old Wood, to Wilshaw, on *Rubus fruticosus*.
FUN. *Coniothyrium Fuckelii* Sacc. Sun Dean and Hoylehouse Clough (Colne Valley), on bramble.

A gall named *Eriophyes rosae* by Swanton is very obscure and greatly in need of revision. It is the same, apparently, as that said by Houdard to occur on a large number of shrubs, and to be the work of a dragonfly, *Lestes viridis* V. der Lind (but within brackets as doubtful). Near Huddersfield it has been found on *Rosa arvensis* in several localities, on guelder rose near Hoyland, and on crab apple at Fenay Bridge.

Mycological Committee.—In the absence of the Secretary, Mr. A. E. Peck, at present abroad, F. A. Mason writes as follows:—This Committee has been well represented at each of the Field Meetings held during the year, and an account of the work done on each excursion has appeared in the Reports of the Hon. Secretaries of the Union, printed in the issues of *The Naturalist* for July, August-September, October and December.

The work of the Committee was particularly well represented at the British Association Exhibition, held at Hull, in September, details of which have appeared in the November issue of *The Naturalist*.

The Annual Foray was held at Buckden, September 30th-October 5th, and was well attended. At the business meeting, Dr. H. Wager, F.R.S., was re-elected Chairman, and Mr. A. E. Peck, Secretary. A full report of this meeting will appear in *The Naturalist* in due course.

The next Annual Foray will be held at Masham, and in order to enable members and others engaged in the teaching profession to take advantage of the Foray during vacation, it will be fixed at an early date in September.

Micro-Biology Committee.—Mr. C. Barlow, Pateley Bridge, reports that the continuous rains during the summer have obscured the development of the usual pond-life in this district. Mr. G. Howard informs us that similar conditions have obtained in the Rotherham district. Mr. R. O. Ducker, Sheffield, records the occurrence of the algæ *Cylindrocapsa involuta* and *C. conferta* from this area. Norton, where these algæ have occurred, is apparently on the Derbyshire side of the boundary, but still within the Sheffield district. The algæ *Botrydium granulatum* is recorded near Halifax. The section provided a number of interesting exhibits (obtained from the polluted waters of the West Riding) for the British Association Meeting at Hull.

GEOLOGICAL SECTION.

(J. Holmes) :—The zoning of the Millstone Grit has been continued by members of the Carboniferous Rocks Committee.

At Easter the county boundary was crossed to examine the Pendleside Series at Pendle Hill, Dinkley, Chipping and Thornley. On this occasion valuable assistance was received from Father Waddington, of Stoneyhurst, and Mr. W. B. Wright, of the Geological Survey. A report of the work done on this excursion has been contributed to *The Naturalist* by Mr. Bisat.

The excursion to the Harden Valley disappointed the palæontologists, but a large number of members followed with interest the explanations of the structure of the district given by the local leaders.

All Committees contributed to the exhibition arranged by the Union for the British Association at Hull in September, the display by the Jurassic Flora Committee being a notable feature. Prof. Kendall's Presidential Address to Section 'C' of the British Association is a valuable contribution to geological literature.

Miss M. A. Johnstone writes :—There has been pleasureable evidence of pre-war activity with regard to the work of this Committee, and on the Field Excursions much attention has been paid to the Carboniferous shales and grits, and their botanical contents, particularly under the leadership of Messrs. Bisat, Holmes and Barker. Evidence of the usefulness of the work of this committee has appeared in several important notes published in *The Naturalist* during the year.

Carboniferous Rocks, Fossil Flora and Fauna Committee :—During the past year considerable numbers of fossil plants from the Coal Measures have been submitted to Dr. Kidston for identification. The returned lists shew that many new records for Yorkshire have been obtained.

Yorkshire Glacial Committee (Mr. J. W. Stather) : Since the last report, papers have appeared in *The Naturalist* on Glacial subjects, viz., 'Recent Glacial Sections in Holderness, February, page 65 ; 'The Kirmington Deposits,' August-September, page 255, both by T. Sheppard, M.Sc., as well as several shorter notes.

The Holderness gravel hills have been described in another journal, but we cannot say that we have gathered much new information from a perusal of the article.

Geological Photographs Committee (Major A. J. Stather) :—It is pleasing to report that interest in the work of this committee is increasing.

Mr. J. T. Sewell, J.P., of Whitby, recently sent in a small series of excellent photographs of glacial beds at the base of the cliffs in the neighbourhood of Whitby and Uppang exposed by exceptionally high tides during the past year, and Mr. J. W. Stather and others have added photographs of the South Cave and other East Yorks. sections.

The albums of photographs, compiled by this Committee, were exhibited at the meeting of the British Association at Hull, and many promises of contributions were obtained.

Coast Erosion Committee.—An important paper on the Erosion

of the Holderness Coast was read by Mr. Chas. Thompson, B.Sc., at the Meeting of the British Association (Section C), at Hull in September. Mr. C. Thompson stated :—In order to demonstrate the extent of the Coast Erosion suffered by Holderness during the past seventy years the following work was done.

Sixty lines were chosen on the 1852 map (6 in. scale), and then the remnants of these lines were measured in the field. The distances obtained were plotted on a 6 in. map (1852), and an *approximate* coast-line drawn.

The various measurements have been scheduled, sheet by sheet, and the actual losses along those lines found. These losses (except two in marshy ground at Kilnsea) are measured from the 1852 cliff edge to the new cliff edge in 1922.

The average annual loss was found for each line and for each sheet.

The results show the following :—

- (1) The losses at different points vary greatly.
- (2) For the past seventy years the rate of loss has been less than the generally accepted one.
- (3) Since the map was revised in 1908-9, the average loss almost everywhere along the coast has been less than that which follows.
- (4) The high cliffs are demolished as speedily as the low ones, since they fall in much larger blocks.
- (5) In trying to reach a definite average loss for the coast it seems to the writer that to reckon the exceptional losses near Kilnsea (chiefly caused by flooding) gives a false impression

Thus, without them, the average annual loss is only 4·8 feet.

The great loss due both to erosion and to flooding raises that average to about 5·6 feet.

This is excessive for more than three-quarters of our line of coast. Even the former average is excessive for seven sheets out of nine.

Committee of Suggestions (Mr. Chris. A. Cheetham) :—The Peat Investigation has progressed steadily during the year, reports will be found in connection with the Society's excursions and the meetings of the Botanical Section ; on the physiological side some difficulties are removed, and interesting theories suggested in the papers by Prof. J. H. Priestley and Dr. Pearsall in the September issue of *The Naturalist*.

During the meeting of the British Association at Hull an exhibit of Peat, Peat-producing plants and the under soil with Pan epitomized the work done on this subject, but judging from a publication not unconnected with this meeting, where 'a great growth of timber' is stated to be the source of a bed of peat, it is evident there is still scope for the Committee's energies in this matter.

The Rivers Investigation produced an exhibit of mosses connected with water of varying hardness, and here again opportunities of the season's excursions have been used to get further information on the hardness of the water in the streams visited.

Soppitt Library —The following contributions to the Library have been received : six parts Bibliographical Contributions from the Lloyd Library ; three parts Notes from the Royal Botanic Garden, Edinburgh ; Proceedings Birmingham Natural History Society and List of Members ; Transactions and Proceedings of the Botanical Society of Edinburgh ; The Muscineae of the Wirral, by W. A. Lee and W. G. Travis ; Transactions and Annual Report of the North Staffordshire Field Club, and List of Members ; Notes on the Seeds of the British Dactylorchids by T. A. Dymes. The Executive have had under consideration the care of the record books of the various sections of the Union and decided that they be placed in the Soppitt Library for preservation and future reference. It is requested that when such record books are completed that they be sent to the Soppitt librarian at the Technical College, Huddersfield.

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AND

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WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

G. T. PORRITT, F.L.S., F.E.S.

JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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YORKSHIRE NATURALISTS' UNION :

VERTEBRATE SECTION.

President of the Section—C. F. PROCTER, Hull.

Two Meetings will be held in the Library of the Leeds Philosophical Society, Park Row, Leeds, at 3-15 p.m. and 6-30 p.m. respectively, on SATURDAY, FEBRUARY 17TH, 1923.

Papers will be given as follows :—

'The Antiquity of the Sheep in Relation to the Early Peoples of Britain,' H. E. Forrest.

'Notes on the Sexes of the Chaffinch in Winter,' W. G. Bramley.

'The Red Necked Phalarope in Orkney and Shetland' (Illustrated), T. H. Fowler and R. Chislett, F.R.P.S.

'British Reptiles' (with Lantern Illustrations), C. F. Procter.

'Notes on the Dunlin and Common Gull,' R. Chislett, F.R.P.S.

Any Member or Associate of the Yorkshire Naturalists' Union is invited to attend and bring specimens or lantern slides, and take part in discussions following the papers.

Will Officers of Affiliated Societies kindly notify their members?

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NOTES AND COMMENTS.

THE W. H. HUDSON MEMORIAL.

We learn from *The Evening News* that there will be general approval of the forms decided on for the W. H. Hudson Memorial. A stone monument is to be set in or near one of the sanctuaries in a London park, Professor Rothenstein's portrait of Hudson is to be bought for the National Portrait Gallery, and the money left after these things are accomplished is to be used for the preservation of bird life. No doubt there will be an enthusiastic response to Mr. Cunninghame Graham's appeal for subscriptions to be sent to Mr. H. R. Dent, honorary treasurer of the fund, at Aldine House, Bedford Street, W.C.2, but the idea of a Hudson memorial is surely superfluous. Hudson has wrought things more enduring than bronze, and piled his own monument. Less than the follower of any other art does a writer require that his personality should be recalled to posterity. The nation ought to have the portrait: we ought to stop the senseless destruction of bird life; but it would have been more fitting to see to these things as a tribute to Hudson rather than as a 'memorial.'

HORNSEA'S RACE FOR LIFE !

'W.S.' writes a special article to one of the London Dailies on 'How we (*sic*) fight the Sea.' He says Scarborough has 'spent upwards of a million pounds in trying to keep back the sea.' 'At Hull *the sea walls* have to be maintained to prevent the Humber from more frequently overflowing and to save the town from *gradually being washed away*. At Hornsea the sea encroaches *faster than the authorities can prepare defences*, and periodically portions of the town *have to be moved farther inland*. Skegness has suffered heavily this year as well, and something like £5000 a year is spent on coast defences there. On the west coast, too, *despite the fact that Ireland forms a sort of bulwark*, there is along a great proportion of the coast a big expenditure on trying to keep out the sea.' It must be nice to be able to write, and presumably get paid for, special articles like this !

SOUTH EASTERN NATURALISTS.

With the aid of a special subscription, 'The South Eastern Naturalist, being the Proceedings and Transactions of the South Eastern Union of Scientific Societies for 1922,' has appeared, and is sold by the Secretary, H. Norman Gray, 334 Commercial Road, London, E.1, at 5/-. It consists of lxiii.+73 pages; the first section being devoted to the Proceedings of the Congress, and the second to the following papers:—'Small Rivers as Sources of Power, with special reference to the River Itchin,' by Charles F. Close; 'History of Lichens in the British Isles,' by A. Lorrain Smith; 'Brain-

Tissue, the Web of Thought,' by Alex. Hill ; ' Whither is Biology leading us?,' by F. Victor Branford ; ' The Botany of the Southampton District,' by J. F. Rayner ; and ' The Biology of Spartina,' by S. Mangham.

ENERGETIC EDITORS.

We learn from the Editorial that ' Even the most energetic editor cannot be in two places at the same time,' consequently he fears that some of the reports ' will be found more meagre than others,' although he was assisted in their preparation by members of the Congress ! Personally we think that brevity is sometimes an advantage. For instance, nine pages of small type are occupied by an account of a visit to the Southampton Docks, and the details recorded may be of use to Engineers, but they are not of natural history interest, and in our opinion valuable space is wasted in giving elementary descriptions of cold storage plant, etc. We notice that on this occasion Commander Martin expressed the thanks of the members to the authorities for allowing them to go round. As a frontispiece are two groups, one showing some officers of the Union, and the other some members. The papers which are of particular value are those by Mr. Rayner, Professor Mangham, Mr. A. Lorrain Smith, and Colonel Sir Charles Close, and if the Editor can secure more contributions of this type the scientific standard of the publication would be considerably improved.

BRITISH MYCOLOGISTS.

The British Mycological Society has just issued Parts I. and II. of Vol. VIII. of its *Transactions*, which contain Mr. Carleton Rea's Presidential Address, and a whole sheaf of valuable contributions, among which the following may be particularly mentioned :—' The Worcester Foray,' by E. M. Wakefield ; ' List of Mycetozoa found during the Worcester Foray,' by G. Lister ; ' Lichens found during the Worcester Foray,' by H. H. Knight ; ' Orchid Mycorrhiza,' by J. Ramsbottom ; ' Mycorrhiza in the Ericacæ,' by M. Cheveley Rayner ; ' An Eocene Microthyriaceous Fungus from Mull, Scotland,' by W. N. Edwards ; ' The Structure and Affinities of *Leuconostoc mesenteroides* (Cienkowski) van Tieghem,' by W. B. Crow ; ' Some Observations on the Mycophagous propensities of Slugs,' by W. T. Elliott.

POURING OIL.

At the fourth Annual Meeting of the Oilfields of England Company recently, it was stated :—' The development of the company's properties at Kelham, near Newark, had not yet reached the productive stage, and the entire expenditure incurred thereon during the year had again been capitalised. . Since September last, work on the estate had been

proceeded with, and a depth of 1717 feet had been reached, but the directors regretted that it had not yet been possible, owing to the difficult nature of the Trent valley strata, to effect completion of this well, though the footing accomplished was not unsatisfactory.' However, the shareholders had the satisfaction of hearing that King Alfonso was taking a keen interest in the progress of the company's work!

BRITISH OIL.

In his Presidenital Address to the Institution of Mining Engineers, printed in its *Transactions*, Prof. W. S. Boulton states: 'In the late years of the Great War we had a new sensation in the systematic boring for oil in Derbyshire and other parts of the country. I shall not say one word in discouragement of those attempts to ease what, at that time, was a most dangerous situation for this country—indeed, I myself had some small personal responsibility in the undertaking—but, at any rate, now that these experimental borings have been made in areas and on sites which, in my opinion, were well chosen for the purpose, we must admit, I think, that the chances of tapping natural oil in commercial quantities in this country are exceedingly small.' We are glad to find such an official confirmation of the views we expressed when these borings were commenced.

KIMMERIDGE FOSSILS.

The familiar 'Summary of Progress of the Geological Survey of Great Britain' for 1921 (this year issued at 5s.) contains a great amount of valuable geological information. Under 'Palæontological work' we learn that a study of the Hudleston collection by Mr. C. P. Chatwin showed the necessity for a re-examination of the Kimmeridge and Portland succession at Swindon. Mr. Chatwin and Mr. J. Pringle have paid visits to that locality and have added considerably to our knowledge of the zones represented there. They were successful in establishing the presence of the *Rasenia* and *Gravesia* Zones of the Kimmeridge Clay, which Dr. Salfeld had been unable to record. They have also shown that the fauna of the so-called Portland Sands, which there includes many uncrushed ammonites, belongs in reality to the upper part of the *Vigatites* Zone, thus confirming the suggestion of the late H. B. Woodward that the overlying Swindon Clay is comparable with the Hartwell Clay of Aylesbury.

A LINCOLNSHIRE BORING.

From the same publication we learn that a boring for water at Old Gate, east of Sutton Crosses, near Long Sutton, Lincolnshire, was visited by Mr. Pringle and proved to be of much interest. Under a cover consisting of 55 ft. of yellow sand underlain by 140 ft. of grey boulder-clay with flints and chalk-

pebbles, Jurassic clays were penetrated. These were proved to a thickness of 106 ft. and were shown by the evidence of fossils to belong to the lower part of the Ampthill Clay and to the Oxford Clay down to its middle portion. This fact throws some light on the position of the western boundary of the Kimmeridge Clay under the superficial deposits of the Wash.

LIVERPOOL BIOLOGISTS.

The ever welcome *Proceedings and Transactions of the Liverpool Biological Society* (301 pages, one guinea) have recently been received, and among the contents we notice 'Presidential Address: Functions of a Public Museum,' by Herbert R. Rathbone; 'Sex Determination: A Suggestion,' by Mrs. Bisbee; 'Notes on Dinoflagellates and other Organisms Causing Discolouration of the Sand at Port Erin,' by E. Catherine Herdman; 'The Marine Biological Station at Port Erin, being the Thirty-fifth Annual Report of the Liverpool Biology Committee, now the Oceanography Department of the University of Liverpool,' by Prof. J. Johnstone; 'Report for 1921 on the Lancashire Sea-Fisheries Laboratory at the University of Liverpool, and the Sea-Fish Hatchery at Piel, near Barrow,' edited by Prof. James Johnstone; 'Classes, and other Work at Piel,' by A. Scott; 'The Plaice Fisheries of the Irish Sea,' by J. Johnstone, W. Birtwistle and W. C. Smith; 'A Biometric Study of Irish Sea Herrings,' by W. Birtwistle and H. Mabel Lewis; 'Chemical Composition of the Mussel, Tables of Results,' by R. J. Daniel; and 'Some Diseases and Parasites of Fishes,' by J. Johnstone. Our friends in Liverpool believe in *work*.

HERRINGS.

The Fishery Board for Scotland is to be congratulated on the publication of its 'Scientific Investigations, 1922, No. I.' (26 pp., 2/6), by Catherine W. M. Sherriff and Prof. D'Arcy W. Thompson. In the Introductory note the latter states: 'Since the days of the old Dutch naturalist, Leeuwenhoek, some two hundred and fifty years ago, it has been known that the scales of fishes show a peculiar structure. They are built up of concentric *rings*, which increase in number as the fish grows older and bigger; the rings may be half hidden by other structures, they may be faint or plain to see, they may be hard to count or easy, but still they are there. They resemble, somehow, the "rings of growth" in the wood of a tree: but it may be an open question how close the resemblance really is, and what conclusions we may draw from it. In the tree we *understand* the phenomenon. As summer follows winter so does growth follow a period of rest; the wood is

laid down, the tree is built up by *annual* instalments ; we count the rings and know, in years, the age of the tree. There is no doubt about it. The count of rings tallies with the known age of the tree ; and broad or narrow rings, here and there, tally with our recorded memory of the weather in particular years. But are we on equally firm ground when we count the rings in a fish's scale, and say that that fish is just so many years old? It is generally believed so ; but I am one of the few who remain doubtful.'

AGES OF HERRINGS IN SHOALS.

' In the case of the herring, the question becomes of very great importance : it is not too much to say that our whole conception of the life of the herring and of a herring-shoal depends on the answer to it. Whenever we examine a sample of herring from a shoal, we find herring differing from one another in the number of their scale-rings : we usually find one well-marked predominant number, while other fish show less or more—fewer and fewer of them as we depart further from the mean. If we believe that the scale-rings are a constant and infallible mark of age; then we must conclude that our shoal is a mixed assemblage, that herring of many different ages, spawned here or there, in this year and in that, have come together to form it,—that there is no unity, no homogeneity, no constancy in a "shoal." But if we believe that the number of scale-rings is a *variable* character (as size itself is, as most things in organic nature are), then we are led to the conclusion that a herring-shoal is (so to speak) one great family-party, a vast company of fish all of an age, fish that were spawned together, and that have ever since lived and swum and migrated together. It is to this latter belief that I lean.'

MARINE BIOLOGICAL ASSOCIATION.

The following valuable memoirs, many illustrated, appear in the admirable *Journal of the Marine Biological Association* issued recently, at the remarkably low price of seven shillings :—' Rays and Skates,' by R. S. Clark ; ' Food of Plankton Organisms,' by Marie V. Lebour ; ' Food of Young Plaice,' by A. Scott ; ' Young Stages of *Blennius ocellaris* L., *B. pholis* L., and *B. gattorugine* L.' and ' Post-larvæ of the Wrasses occurring near Plymouth,' both by E. Ford. ' Manufacture of Drift Bottles,' by E. W. Nelson ; ' Hydrogen Ion Concentration of Sea Water in its Biological Relations ' ; ' Respirable Organic Matter of Sea Water ' ; ' Di Brom Thymol Sulphone Phthalein as a reagent for determining the Hydrogen Ion Concentration of Living Cells ' ; ' Hydrogen Ion Concentration of the Cells of some Marine Algæ, etc.', by W. R. G. Atkins ; ' Plymouth Peridians,' by M. V. Lebour ; ' The

Genus *Ilyanthus* Forbes,' by T. A. Stephenson ; ' Life-history of *Parorchis acanthus* Nicoll, a Trematode in the Herring Gull,' by M. V. Lebour and Richard Elmhirst ; and ' Occurrence of *Echinus esculentus* above Low-tide Mark on the Cornish Coast,' by E. Trewavas.

LEEDS NATURALISTS.

The new session of the Leeds Naturalists' Club was opened on Monday, January 15th, by a highly successful Conversation, held at the University, under the Presidency of Mr. E. E. Gregory. There were large numbers of attractive exhibits in every department of natural history. Mention may be made of a map of Yorkshire showing, by means of red circles, about 300 places which have been made the Headquarters of the meetings of the Yorkshire Naturalists' Union, and above it was placed the following legend :—' Every member of the Leeds Naturalists' Club is an Associate of the Yorkshire Naturalists' Union. Note the places visited by the Union. Claim your circular and join the excursions. Forms of nomination for membership may be obtained from the Secretaries.' Although this map incidentally contains some other information, of merely mycological interest, it well illustrates the activity of the Union, and we understand that any Secretary of an affiliated Society who will put the map to similar use may borrow it upon application to the Secretaries, The University, Leeds.

A HUM-BUG HOUSE.

The Entomologist's Record for January gives the following notes, presumably on ' popular ' natural history :—' We quote on a current topic from the *Los Angeles Times*, " The Bug House.—Over in Vienna an eminent biologist has performed some wonderful operations on insect life. He has transposed the heads of various bugs. He has grafted the dome of a beetle on the shoulders of a wasp, and made a mild-tempered and patient creature out of a fussy and useless one. It is significant that in all his experiments the head carries the initiative and inspiration. If he should take it in mind to graft the noodle of a mosquito on the neck of a grasshopper we would have a blood-thirsty creature with a barb-wire kick and the capacity of a saw-mill. When bees and butterflies have their heads transposed it is the brain that carries the control of the body. The bee with the butterfly head becomes frivolous and only seeks the flower for its perfume. On the other hand, the butterfly with the brain of the bee attempts all the processes of honey-making, and may develop a case of hives. If the scientists keep making progress we may soon see the crossing of a speed bug with a road beetle, and the production of a Ford that can not only think but climb trees." "

DUTIES OF FIELD NATURALISTS.

We are sorry to have to draw attention to the fact that one of our oldest and most respected Field Clubs has 'lapsed' in allowing a public appeal to be made for some of our rarest birds, etc., which 'should be sent either stuffed or immediately after death to the Librarian at the Public Library.' However desirable it may be to 'complete' a collection of British Birds and Mammals (a feat, by the way, which is impossible), it should be the duty of a Field Club to see that protection is given to rare forms. Some directors of museums, we know, have no conscience, but few would care to accept the responsibility for an appeal such as the following. Besides, how is it possible to comply with the wishes of the Club without breaking the Wild Birds' Protection Acts?

HEREFORD CITY MUSEUM.

The following is a copy of the circular, headed as above, sent out recently with a notice of the Woolhope Field Naturalists' Club:—

'In the Museum at Hereford are good collections of British Birds and Mammals, but there are still some specimens wanted to make them fairly complete. May I ask the Members of the Woolhope Club to help to supply the deficiencies.

'Specimens should be sent either stuffed *or immediately after death* to the Librarian at the Free Library; and if Members are good enough to have them stuffed it is not necessary that they should be in any kind of case.'

[Then follows the names and addresses of good taxidermists].

'The following are specimens that are wanted:—

Birds.

Black Redstart	Woodchat	Black Tern
Dartford Warbler	House Martin	Gullbilled Tern
Fire Crested Wren	Sand Martin	Sandwich Tern
Reed Warbler	Twite, or	Sabine's Gull
Marsh Warbler	Mountain Linnet	Little Gull
Grasshopper Warbler	KENTISH PLOVER !	Glaucus Gull
Bearded Titmouse	Common Redshank	Blacknecked Grebe
Marsh Titmouse	Spotted Redshank	Storm Petrel
Rock Pipit	Black-tailed Godwit	

Mammals.

Lesser Shrew	Whiskered Bat
Serotine Bat	Horseshoe Bat
Hairy-armed Bat	Barbastelle Bat
Daubenton's Bat	Black Rat
Reddish Grey Bat	Water Vole

(Signed) FRANCIS B. JAMES.'

BIRDS FOR THE LEEDS MUSEUM.

While all northern naturalists will welcome the fact recorded in a half-column report in *The Yorkshire Post* that Leeds has bought a small collection of birds ; in the interest of the scores, one might say hundreds, of collections in public and private hands in the country one must protest against the statement made that the eleven cases recently secured form a collection 'probably one of the finest of its kind in the country.' We know the cases of birds recently purchased quite well ; in fact, had the opportunity of securing them, but we only obtained from Mr. Wade such examples as were not in our collection—the eleven purchased by Leeds being already represented here. It is admitted that Mr. Wade's cases are most artistically 'set up,' but at Hull are hundreds of cases prepared by the same taxidermist, and there are certainly scores of larger and more important collections than the Leeds eleven within no very great distance of Leeds.

BIRDS AT HULL.

The Hull collection, which is not claimed to be 'one of the finest in the country' (whatever we may think !), contains the Sir Henry Boynton Collection, the H. J. Robinson Pease Collection, the Riley Fortune Collection, the Anderson Collection, and important cases selected from those obtained by Mr. E. W. Wade, the late Thomas Audas, Johnston Swailes, and others, as well as the entire collection formed by the Hull Literary and Philosophical Society, which was very similar in size and general character to that formed by the Leeds Literary and Philosophical Society. A little while ago the Leeds Museum 'would shortly possess' one of the finest collections of prehistoric remains in the country (shades of Mortimer and Bateman !); later it is said to have one of the finest geological collections in the country, and so on. While we welcome the present activity in Leeds, we can only suggest that someone there is looking through a telescope.

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We learn from the *Report of the Warrington Museum Committee*, recently received that the three dug-out canoes have been removed from the basement to a position near the entrance to the Art Gallery.

We have received Part I. of *Prace Zoologiczne : Polskiego Panstwowego Muzeum Przyrodniczego (Annales Zoologici Musei Polonici Historiae Naturalis)*, which contains articles in German, French, etc., and one in English 'On Some Rare or little known Species of South Brazilian Birds,' by T. Chrostowski.

The Bulletin of Bureau of Bio-Technology for October contains a number of interesting contributions, including 'Study of the Causation of Ropiness in Worts and Beers,' by P. Hampshire ; 'Biological Aspects of a Defective Drainage System in a Brewery,' by F. A. Mason ; 'Potato Trials, 1921,' by T. Parker and A. W. Long ; 'The Suppression of Insect Pests and Fungoid Diseases,' by Theodore Parker.

FOSSIL PLANTS FROM THE UPPER ESTUARINE SERIES.

M. BLACK.

IN the Lower Oolites of the Yorkshire Coast there are three Estuarine Series, all of which contain well-preserved fossil plants.

The Geological Survey Memoir* dealing with this district contains a list of plants found in the two lower series, and this has been revised from time to time. The Upper Estuarine Series, however, is usually considered to be comparatively barren, only yielding plants in any numbers at two localities—Scalby Ness and White Nab, both near Scarborough. The Geological Survey list of plants from this series only includes nine species, and has not been revised since 1903.

Whilst collecting from the beds in the same and neighbouring localities, I have found six out of the nine species already recorded, and in addition have discovered fourteen species not previously recorded from these beds, bringing the total to twenty-three. Two of these have the additional interest of being new to Yorkshire.

The following is a list of species now known, those newly added being marked with a dagger (†), and those new to Yorkshire with a double dagger (‡).

EQUISETALES.

- Equisetites columnaris*†. . . Scalby, Burniston.
E. beani (?)† . . . Scalby, Burniston.

FILICALES.

- Coniopteris hymenophylloides*†. Scalby Ness.
C. arguta. . . Burniston, Red Cliff.
C. sp.† . . . Scalby.
Cladophlebis denticulata. . . White Nab, Scalby Ness.
Eboracia lobifolia† . . . Scalby Wyke.
Gleichenites (?) † ‡ . . . Scalby Ness.
Laccopteris woodwardi . . . White Nab.

CYCADOPHYTA.

- Nilssonia compta* . . . Scalby, White Nab.
Otozamites beani (?)† . . . Burniston.
O. graphicus † . . . Scalby Wyke.
O. obtusus† . . . Scalby, White Nab.
Zamites gigas† . . . Scalby, White Nab.

* Geological Survey Memoir : Explanation of Sheets 44 and 35, new series (2nd edition, 1915), p. 108.

CONIFERALES.

<i>Conites</i> sp. †	Burniston.
<i>Brachyphyllum mamillare</i> †	Burniston.
<i>Pagiophyllum williamsoni</i> †	Scalby.

GINKGOALES.

<i>Baiera gracilis</i>	Scalby Ness.
<i>B. lindleyana</i>	Scalby.
<i>B. phillipsi</i>	Scalby.
<i>Czekanowskia murrayana</i>	Scalby.
<i>Ginkgo digitata</i>	Scalby Ness, Red Cliff.

PLANTAE INCERTAE SEDIS.

<i>Carpolithes</i> sp. † ‡	Scalby, Burniston.
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I am much indebted to Mr. Hamshaw Thomas and Mr. W. N. Edwards for the kindness which they have shown in naming specimens and in confirming my own identifications.

The most interesting plant recorded in the above list is *Carpolithes*, the species found being apparently of a type new to Yorkshire. The seeds collected vary in form, some being almost flat and approximately circular, whilst others show a flat wing-like area with a raised central part, rounded at one end and pointed at the other. The diameters vary from about 3 mm. to 7 or 8 mm. These seeds are being investigated by Mr. Thomas, who will publish particulars in due course.

The matrix in which the seeds were found is a dark, brittle shale in the Upper Estuarine Series at Scalby Ness and elsewhere. Owing to the irregular bedding of this series, it is almost impossible to tell whether this shale is a continuous bed or is only found in isolated patches. At the exposure at Burniston, from which seeds were obtained, the beds are more regular, and almost level. The following section at Burniston Fields was measured by Mr. Bevan :—

Thin-bedded sandstone with partings of shale	14 ft.
Shale-sandstone	4 ft.
Poor Sandstone	6 ft.
Shale with slipped undercliff	28 $\frac{3}{4}$ ft.
Massive sandstone	3 ft.
Shale	3 ft.
Massive sandstone	1 ft.
Shale	16 ft.

The seeds were found in this locality towards the top of the 28 $\frac{3}{4}$ ft. bed of shale. This section gives an indication of level of the seed producing beds with regard to the marine beds of the Lower Oolites in the coast area. Although the dip in these beds is somewhat uncertain, the base of the shale at the

foot of this section may be taken as being 60 feet above the highest bed of the Grey Limestone Series, which crops out less than half a mile further north. This makes the bed from which the seeds were obtained at Burniston approximately 100 feet above the top of the Grey Limestone Series.

Two cones found at Burniston are not of the type usually met with in the Estuarine Series of the Yorkshire Coast. The male cones of *Pagiophyllum williamsoni* are ordinarily a little less than one inch in length, whereas the cones recently found reach almost three inches. On chemical treatment of the carbonaceous matter from the cones, spores resembling those of *P. williamsoni* were obtained. A similar cone was found in the Middle Estuarine Series at Gristhorpe, but did not show any fresh structural details.

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The Irish Naturalist for January contains a note by N. H. Foster on 'The Sleeping Habits of the Tree-creeper.'

We regret to notice that Professor G. H. Carpenter relinquishes the Editorship of *The Irish Naturalist* in consequence of his retirement from the Royal College of Science for Ireland. His place is being taken by Mr. C. B. Moffatt.

Ours, the magazine of Messrs. Reckitt for January, contains what is described as 'Greetings from our Sydney House, Australia, 1923,' and is a representation of the Australian Kookaburra or 'Laughing Jackass.' Possibly there is more in this than meets the eye.

Part 194 of *The Yorkshire Archaeological Journal* contains a description of a small Roman bronze eagle found at Keighley, and Roman inscribed stones from Greta Bridge and York. In the same Journal the opinion is expressed that the name of Fountains Abbey originated with the spas and fountains of Knaresborough.

The *Entomologist's Monthly Magazine* for January contains 'Further Notes on the Natural History of *Melanophila acuminata* DeG.,' by George B. Ryle; '*Anthicus constrictus* Curt., a valid Species,' by J. Saint-Claire Deville; and 'Neuroptera (in the Linnean Sense) from Argyllshire,' by Kenneth J. Morton, among many other items.

In future *The Entomologist* will be carried on under the general editorship of Captain Norman D. Riley, in place of Richard South, who has been the general editor for so many years. The December number of this journal gives 'Light Trap Experiments in connection with Temperature, etc.,' by Major Frederick Gillett, among other papers.

The Selborne Magazine for June, 1922, to January, 1923, No. 350, recently issued, contains particulars of the Receipts and Payments Accounts of the Selborne Society for the five years ending December, 1921. The names of 106 new members of the Society are given, and the editor appeals for a number of editions of White's 'Natural History of Selborne,' although the Society already possesses 131 different editions of this work.

We learn from *The Entomologist's Record* for December that 'Ugly stories come to us from Royston. We hear of sweeping for *A. ciridon*, poison-bottles crammed with specimens good and bad, the hillside dotted with small patches of those thrown out of the killing bottles and rejected, etc. It is much to be hoped that these stories are extreme exaggerations, if not fabrications.' The same journal contains 'Notes on the Geographical and Seasonal Variations of *Pararge megera* L.' by Roger Verity.

THE SOUTH WESTERN NATURALISTS' UNION.

THE Exhibition of Regional Survey and other work of the Yorkshire Naturalists' Union, held at Hull, during the visit of the British Association in September last, has had various satisfactory results, both direct and indirect, not all of which are obvious to the general body of members. One effect has been to correct an impression, current outside the county, that the work of the Union is largely dependent upon dilettante naturalists, or working men, who pursue natural history as a hobby in such time as may be spared from the pit or workshop. It was a genuine and gratifying surprise to many who had thus regarded the activities of the Union, to find the heads of professional science in Yorkshire closely collaborating with amateurs of the best possible type in survey work on strictly scientific lines.

Another and highly complimentary result has been the inception of a new Naturalists' Union, with the above title. For some time past there had been on foot among the naturalists of the South-western counties a movement for closer cooperation and, thereby, greater usefulness. Mr. Charles Hunter, who had taken an active interest in that movement, after seeing the Yorkshire Naturalists' Union Exhibition, came to the conclusion that the difficulties of the naturalists in the west could be solved by organisation on the lines of the northern naturalists, and lost no time in acting up to his convictions.

At a meeting held on November 25th, 1922, in the Council Chamber of the University of Bristol, the formation of the South Western Naturalists' Union, with a constitution based on that of the Yorkshire Naturalists' Union, was formerly adopted. Representatives from ten Natural History and Scientific Societies of the counties of Gloucester, Somerset and Wiltshire were present at the meeting, and it is expected that strong support will be forthcoming from the counties of Dorset, Cornwall and Devon. Messages in favour of the formation of the Union, and wishing it success were received from the British Association for the Advancement of Science, the Yorkshire Naturalists' Union, the Lancashire and Cheshire Fauna Committee, the Leeds Naturalists and Scientific Club and the Huddersfield Naturalists' Society.

The subscription to the South Western Naturalists' Union is 15/- per annum. In addition to the provision for the affiliation of recognised Natural History Societies, there is a wise arrangement for the encouragement of School Societies at a subscription of 5/-, while for Public Institutions the subscription is 25/-. The Executive will compile a Register of natural history workers within the area, showing addresses and the special subjects of their interest. The Sections, of which there is one for each main subject, Botany, Zoology, Geology, will elect their own sub-sections, and each will *keep its own records on uniform lines by card index in such manner as to be readily accessible.*

The new Union has been fortunate in having secured the assent of Emeritus Professor C. Lloyd Morgan to act as its first President, and that of Prof. O. V. Darbyshire to be its Treasurer. Mr. Chas. Hunter, of the Bristol University, has been appointed Editor, and the Hon. Secretaries are Mr. Pearman and Mr. H. Womersley.

This list of officers is in itself a good augury for the success of the South Western Naturalists' Union, and its progress has the best wishes of every northern naturalist.—F. A. M.

It may be remembered that the Lincolnshire Naturalists' Union largely owed its origin to the enthusiasm of the late W. D. Roebuck and other Yorkshire Naturalists' Union members, and when the South Eastern Union of Scientific Societies came into being years ago, the present writer, then Hon. Secretary of the Yorkshire Naturalists' Union, was a good deal behind the scenes ; but these matters soon get forgotten.—T. S.

YORKSHIRE COLEOPTERA IN 1921.

W. J. FORDHAM, M.R.C.S., L.R.C.P., D.P.H., F.E.S.

THE following list contains records of over 120 species, including 13 species and 2 well marked varieties new to the County List. Reference should be made to various articles in *The Naturalist* for 1921, and to the reports of the Yorkshire Naturalists' Union Excursions; notes will also be found in the *Ent. Monthly Mag.* The following reports on the season are of interest:—

Mr. M. L. Thompson says that the very dry weather during the best collecting months seemed to banish the Coleoptera. Mr. G. B. Walsh notes that owing to the mild winter there was no spring collecting as such, but insects seemed to be on the move all the time. Many were undoubtedly scarce, *e.g.*, the *Phyllobii*, etc. On the other hand, certain rare species have been common, *e.g.*, *Euthia schaumii*, *Orsodacna cerasi* and *Bembidium nigricorne*. Absence of hawthorn bloom was a great loss from a collecting point of view, and not a single specimen of *Anthonomus pedicularius*, a species associated with it, was seen. Mr. E. G. Bayford reports a marked absence of beetles, the only one specially numerous being *Adalia bipunctata* L., principally variations of the abs. *sexpustulata* L., and 4 *maculata* Scop., some of which have the spots reduced to very small dimensions.

ABBREVIATIONS, ETC.

† = New to County.

* = New to Vice County.

J.M.B. = J. M. Brown.

F.A.M. = F. A. Mason.

C.G.C. = C. G. Caird.

T.S. = T. Stainforth.

W.J.F. = W. J. Fordham.

M.L.T. = M. L. Thompson.

W.D.H. = W. D. Hincks.

A.E.W. = A. E. Winter.

J.H.K. = J. H. Keys.

G.B.W. = G. B. Walsh

T.B.K. = T. B. Kitchen.

H.H.W. = H. H. Wallis.

Carabus nitens L. Baysdale Moors, five examples, May, M.L.T. Harwood Dale Moor, nine specimens, by pulling up handfuls of sphagnum and felted algæ, July, T.S. In the same locality occurred several *Pterostichus lepidus* F. and *P. adstrictus* Esch. (*vitreus* Dej.). The latter occurred on Allerthorpe Common in June, T.S., W.J.F. (*61), and was common on Blubberhouses Moor in May, A.E.W.

P. lepidus F. was found sparingly on Allerthorpe Common (where it was discovered in 1919), in June, T.S., W.J.F., together with *Miscodera arctica* Pk. A serious fire broke out on this Common in July, and will probably have endangered the existence of these local rarities. Industrial developments on Tees Side have almost destroyed the locality for *Miscodera* at Grangetown, but the species was taken in peat cuttings on Harwood Dale Moor in July, T.S., and still occurs near Bradford, H.H.W. An unrecorded occurrence between Reeth and Askrigg, August, 1913, A. A. Fordham, extends its range in a north-westerly direction.

- Blethisa multipunctata* L. Skipwith Common. Three under felted algæ in a dried-up pond, T.S. (Yorkshire Naturalists' Union Excursion, August). In times of drought, the examination of dried-up sphagnum, algæ and vegetable debris is often a prolific method of beetle collecting, and is especially useful in the search for riparian *Geodephaga* and *Staphylinidae*.
- Bembidion nigricorne* Gyll. Ravenscar, September, W.J.F. Stony Marl Moor, numerous in August, running in open spaces on dried matted algæ, beneath which occurred numbers of *Dyschirius globosus* Hbst., and not uncommonly *Bembidion mannerheimi* Sahl., G.B.W.
- B. gilvipes* Sturm. Harwood Dale, uncommon, G.B.W. (*62).
- Trechus discus*. Heaton, near Bradford, H.H.W.
- Amara similata* Gyll. On flower heads of bluebell, Bilton Woods, near Harrogate, A.E.W.
- Amara consularis* Duft. Adel, July, 1920, T.B.K.
- Sphodrus leucophthalmus* L. Scarborough, one specimen in a cellar, G.B.W. This insect was taken many years ago at Scarborough by R. Lawson. Another old record is Halifax (R. Leyland). The remaining, and hitherto most recent, record, Huddersfield (S. L. Mosley), dates back to 1884.
- Metabletus foveatus* Geoff. Flixton, June, several at plant roots in sand pit, G.B.W. The locality is in V.C. 61, but within the Scarborough district. V.C. 62 is the only area without records.
- Microlestes (Blechrus) maurus* Stm. Bubwith, flood refuse, Jan., J.H.K. (W.J.F.).
- Dromius meridionalis* Dj. Leeds, March, C.G.C.
- Hygrobia tarda* Hbst. For an account of the rediscovery of this beetle by Mr. T. Stainforth, and also for notes on the extended range of *Dytiscus circumflexus* F. in the Humber area, see *The Naturalist*, 1921, June, p. 212.
- Agabus bipustulatus* L., with very marked large orange spots on the head. Sheffield, J.M.B.
- Hydroporus lepidus* Ol. Carterknowle, Sheffield, J.M.B.
- Rhantus punctatus* Geoff. (*pulverosus* Steph.) Leeds, Feb., C.G.C.
- Rhantus grapii* Gyll. Skipwith Common, 1911, G.B.W. (*61). Also Aug., 1921, A.E.W.
- Gyrinus marinus* Gyll. Barmby Moor, June, numerous imagines and two larvæ, T.S.
- Helophorus porculus* Bedel. Sandsend, a small colony at the roots of a single plant of *Cakile*, Sept., W.J.F.
- H. aequalis* Th. Bubwith and Allerthorpe Common, W.J.F. (*61).
- Ochthebius bicolon* Germ. (*rufimarginatus* Steph.). Bubwith, flood refuse, J.H.K. (W.J.F.), *61.
- Philhydrus minutus* L. Biller Howe Dale, one in a peat hole, G.B.W. (*62).
- Oxypoda lentula* Er. Bubwith, flood refuse, Jan., J.H.K. (W.J.F.) *61, a very dark example, with the entire upper surface almost black, including the apex of the hind-body. Legs pitchy. (Confirmed by C. G. Champion.)
- †*Ocyusa maura* Er. Bubwith, flood refuse, Jan., J.H.K. (W.J.F.), one example. This species is not uncommon in the South and Midlands, but the only northern records apparently are in Cumberland, where it is locally common (F. H. Day).
- Ocalea picata* Steph. (*castanea* Er.). Middleton-in-Teesdale, 1911, W. E. Sharp, Cotherston, G.B.W. (*65).
- †*Atheta currax* Kr. Richmond, G.B.W., a species mainly confined to the north, but taken in Devonshire (de la Garde). The late W. E. Sharp had a specimen from Bubwith flood refuse (Dec., 1916), which he considered this species; as it was slightly abnormal, however, it was not recorded.

- Atheta sulcifrons* Steph. (*pavens* Er.). Bridlington, August, J.M.B. (*61).
- A. insecta* Th. Bubwith, flood refuse, a male, J.H.K. (W.J.F.).
- Tachyusa atra* Grav. With the last, 24 specimens, mostly crippled, three with, in each case, an *Acarid* attacking it between the integuments of the body.
- Autalia rivularis* Grav. Heaton, H.H.W. (*63).
- Tachyporus formosus* Mat. Richmond, in cut grass, G.B.W. (*65). This species is recorded from Yorkshire by Stephens (Manual Brit. Coleoptera). There are apparently no recent records.
- Bryocharis inclinans* Grav. Roundhay, Jan., C.G.C.
- Mycetoporus clavicornis* Steph. Mickle Fell, G.B.W., *65.
- Quedius ochripennis* Mén. (*puncticollis* Th.). Three specimens in a wasp's nest, Sept., Harrogate, A.E.W., together with one example of *Cryptophagus pubescens* Stm. Both species were taken at Studley by Waterhouse.
- Q. othiniensis* Johan. In a mole's nest, Raincliff Woods, in March, G.B.W., *62.
- Q. umbrinus* Er. and *auricomus* Kies. Hayburn Wyke, abundant in moss in waterfall (G.B.W., T.S., A.E.W.), together with *Stenus guynemeri* Duv., *Lesteva punctata* Er. and *pubescens* Mann., more or less commonly.
- Q. fumatus* Steph. Wike, C.G.C., *64.
- Q. oblitteratus* Er. Bubwith, flood refuse, J.H.K. (W.J.F.).
- Q. rufipes* Grav. Heaton, H.H.W.
- † *Philonthus carbonarius* Gyll. Adel Dam, March, C.G.C. This local species is widely distributed in Britain, and has probably been overlooked in Yorkshire, where all its near allies are known to occur.
- P. ebeninus* Grav. Adel, April, C.G.C., *64.
- P. varians* Pk. var. † *agilis* Grav. Heaton, H.H.W. Wike, T.B.K. This insect, formerly considered a distinct species, but now sunk in *varians*, has apparently not been recognised in the County previously.
- P. discoidens* Grav. Wike, T.B.K., *64.
- Gauropterus fulgidus* F. Shadwell, March, C.G.C., *64.
- † *Stenus carbonarius* Gyll. Bubwith, flood refuse, J.H.K. (W.J.F.). A rare species, apparently well distributed, but more frequent in the south of England than in Scotland.
- S. nigritulus* Gyll. Wike, March, T.B.K., *64.
- S. foveicollis* Kr. Ingleby Greenhow, M.L.T., *62 (*E.M.M.*, Sept., 1921, p. 209, to which reference should be made for several other interesting Yorkshire Records).
- Oxyporus rufus* L. One in agaric, Marfleet Lane, Hull, August, T.S.
- Micralymma marinum* Stroem. Common in all stages in crevices on scars below high water mark, Robin Hood's Bay, July, T.S.
- † *Phyllodrepa* (*Hapalaræa*) *pygmæa* Gyll. On mountain ash in a moorland wood at Kildale, July, M.L.T. (*E.M.M.*, Sept., 1921, p. 209).
- Euthia schaumii* Kies. This rare species has again turned up at Scarborough Mere, from which locality it was recorded in 1919. Three hundred specimens were taken by evening sweeping in July, G.B.W.
- Catops fumatus* Spence, and *C. watsoni* Spence. Richmond, G.B.W., both *65. The latter also occurred in Bubwith flood refuse, J.H.K., (W.J.F.).
- C. longulus* Kell. Ringinglowe, near Sheffield, Oct., J.M.B., *63.
- Blitophaga opaca* L. Adel, June, T.B.K.
- Phosphuga atrata* L. ab. *brunnea* Hbst. Mulgrave Woods, Sept., five under the bark of a fallen log, W.J.F.
- Xylodrepa* 4 *punctata* L. Sheffield district, see J.M.B. (*E.M.M.*, Oct., 1921, p. 233).

- Liodes calcarata* Er. ab. *nigrescens* Fleisch. Harrogate, A.E.W., *64.
- †*Trichopteryx montandonii* All. In numbers in nests of *Formica rufa* at Barnscliff, Harwood Dale, G.B.W., a generally distributed but local species, occasionally taken in ants' nests. It has occurred with *F. rufa* in the Isle of Wight (Donisthorpe).
- Cateretes bipustulatus* Pk. abs. *ochraceus* Murray and *suturalis* Murray. Forge Valley, by sweeping, G.B.W.
- Cychramus luteus* F. var. *fungicola* Heer. Common in flowers of hogweed in Forge Valley and Sawdon Dale, G.B.W.
- Rhizophagus ferrugineus* Pk. Common under bark in a faggot heap at East Ayton, G.B.W. Seacroft, June, T.B.K., *64.
- Micrambe villosa* Heer. Common on broom at Langdale End and Scalby High Moor, G.B.W. Bridlington, Aug., J.M.B., *61 (a specimen which Mr. J. J. Walker queries as this species).
- Antherophagus pallens* Ol. Bridlington, a male, Aug., J.M.B., *61.
- Triplax aenea* Schal. New Marske, on *Pleurotus ostreatus* F. A. Mason (Y.N.U., June). Leeds, Apl., 1920; Feb., 1921, C.G.C. East Keswick, Apl., T.B.K.
- †*Enicmus histrio* Joy. Not uncommon at Scalby and Burniston, G.B.W. Hull, Eston, and Richmond, G.B.W. A generally distributed species closely allied to *E. transversus*, but not separated till 1910.
- Corticaria crenulata* Gyll. Skipwith, G.B.W., *61. Grangetown, G.B.W.
- Litargus connexus* Geoff. Skipwith Common, under bark of birch stump, abundant and extremely active, T.S. (Y.N.U., Aug.).
- Dermestes lardarius* L. Feeding in flour in bakery, Scarborough, G.B.W.
- Trogoderma khapræ* Arrow. In cereals, Scarborough, G.B.W. Almost certainly imported, but evidently spreading, and likely to become a permanency.
- †*Syncalypta setigera* Ile. Flixton, June, one at roots of plants in sandpit, G.B.W. (Fowler, *Brit. Col.*, Vol. III., p. 367, says that according to Dr. Sharp this species has only occurred in Scotland; but it has since been recorded from the South Coast.)
- Dorcus parallelipedus* L. Common at Waudby Green in decayed ash logs, together with *Sinodendron cylindricum* L., T.S.
- Aphodius obliteratus* Pz. Shadwell, C.G.C., *64.
- †*Leptaulacus villosus* Gyll. One, Redcar, coast sandhills, June, M.L.T. (*E.M.M.*, Sept., 1921, p. 209).
- Anomala aenea* Delj. Warrenby, June, one at thistle roots, M.L.T. Coatham, on dry seaweed on shore, June, F. A. Mason.
- (*Dynastes* species. A specimen of *Dynastes* was found alive at Denaby, in a case of bananas from Jamaica. It survived several days. A. A. Dallman).
- Brachylacon murinus* L. Flixton, six examples in flight, G.B.W.
- Cyphon paykulli* Guer. (*nitidulus* Th.). Shipley Wood, H.H.W., *63.
- Thanasimus formicarius* L. Hayburn Wyke, G.B.W. (not recorded from this locality since taken many years ago by T. Wilkinson).
- Ptilinus pectinicornis* L. Potternewton, Leeds, C.G.C., *64.
- Alosterna tabacicolor* Delj. Bilton Woods, Harrogate, fairly abundant in May, A.E.W.
- Stenostola ferrea* Schr. Bilton Woods, one, May, A.E.W. This rare species was taken at Studley by Waterhouse, and occasionally occurs at Edlington and Wadworth Woods.
- Acanthocinus ædilis* L. Very common in the autumn near the docks, Hull, T.S.; imported, but liable to spread.
- Plateumaris discolor* Pz. Scarborough Mere, G.B.W.
- Orsodacna cerasi* L. Forge Valley, abundant in early July, with ab. *lineola* Lac. and ab. *glabratus* F., G.B.W.
- Chrysomela brunsvicensis* Gr. Mulgrave Woods, on *Hypericum perforatum*, Sept., W.J.F., several. This species did not appear to occur on *H. pulchrum*, which was common in the woods.

- Chalcoides plutus* Lat. (*chloris* Foud.). Bubwith, flood refuse, Jan., J.H.K. (W.J.F.), *61.
- †*Chaetoenema subcaerulea* Kuts. Forge Valley, G.B.W. (This species has apparently never occurred north of the London district (Fowler, Vol. IV., p. 386). It has, however, been much confused with *C. sahlbergi* Gyll., which was taken at Scarborough by Wilkinson and Lawson.)
- Psylliodes picina* Marsh. By evening sweeping round Scarborough Mere, G.B.W.
- Haltica britteni* Sharp. Biller Howe Dale and Scalby High Moor, G.B.W., Ravenscar, G.B.W., W.J.F., *62. Not uncommon in a limited area, Sept. (This species is easily known by the strongly dilated front tarsi in the male.) Ripon (E. A. Waterhouse), *64 (specimens given to W. E. Sharp as *ericeti* all turned out to be *britteni*).
- Longitarsus membranaceus* Fond. Mulgrave Woods, extremely abundant in September, both on *Teucrium*, and by general sweeping, W.J.F.
- †*Bruchidius unicolor* Ol. var. *debilis* Gyll. Somewhat common by sweeping *Helianthemum* above East Ayton, G.B.W. This is the *B. cisti* of the British Catalogues, and has apparently not previously occurred north of Lincolnshire. (*B. cisti* Fab. = *B. villosus* F. is recorded from Sherburn by Curtis (1839), and has been taken at Collingham by Mr. Horrell (Y.C.C. Rep., 1917)).
- Otiorhynchus ligneus* Ol. Heaton, H.A.W., *63. Adel Dam, C.G.C., *64.
- Barypithes araneiformis* Schr. Adel, T.B.K. Shadwell, W. D. Hincks.
- Strophosomus capitatus* DeG. Ilkley, W.W.H. This confirms an old record for Yorkshire by John Walton. The species is generally distributed, but commoner in the South and Midlands.
- Hylobius abietis* L. Leeds, a specimen dropped by a Chaffinch, uninjured, C.G.C. This species is sometimes destructive to pine and fir plantations, and the observation of Mr. Caird suggests that the species is edible and possibly kept in check by insectivorous birds. Being large, it could not be swallowed whole, and was possibly being carried to a safe retreat prior to being devoured.
- Liosoma deflexum* Pz. ab. *collare* Rye. Adel, T.B.K.
- Hypera arator* L. (*polygoni* L.). Adel Dam, W.D.H., *64.
- Limobius borealis* Pk. Crathorne, North Yorks., July, W.J.F., *62, on *Geranium pratense*.
- (*Eirrhinus scirpi* F. was recorded in error from Hawksworth (H.H.W) in *Ent. M. Mag.*, Feb., 1922, p. 42. The specimen is only a fine example of *acridulus* L.)
- Dorytomus tortrix* L. This local species is evidently not uncommon in the Leeds district. In addition to the pale normal form a very dark pitchy variety has been taken in small numbers at Shadwell, C.G.C. Blackmoor, W.D.H., *64.
- †*Dorytomus melanophthalmus* Pk. Common on sallows at Ellerburn and Staintondale, G.B.W., a local species which has occurred both north and south of Yorkshire, so that its discovery in the county is not unexpected.
- Phytobius 4 tuberculatus* F. Bubwith, flood refuse, Jan., J.H.K. (W.J.F.).
- †*Erythrapiion brachypterum* Sharp. Scalby High Moor, G.B.W. This species was added to the British List within the last few years by Dr. Sharp.
- Apion aethiops* Hbst. Common in Hayburn Wyke, G.B.W.
- A. aestivum* Germ. (*trifolii* Brit. Cat.). Heaton, H.H.W.
- Rhynchites harwoodi* Joy. Ellerburn, G.B.W., *62.
- R. germanicus* Hbst. (*minutus* Brit. Cat.). Edlington Wood, W.J.F., *63.

Rhynchites aeneovirens Marsh. Sawdon Dale, G.B.W. A rediscovery of one of Lawson's Scarborough captures. The only other Yorkshire record is Sandburn Wood (W. Hey).

R. cupreus L. Hayburn Wyke, G.B.W. (only known as a Yorkshire insect from the Scarborough district and Kildale in Cleveland).

Hylesinus crenatus F. Harewood, C.G.C., *64.

Pityogenes bidentatus Hbst. Wharnccliffe Woods, J.M.B., *63, Leeds, C.G.C., *64.

Xyloterus domesticus L. Adel Dam, June, fairly common under bark of rotten trunks, W.D.H., *64, Leeds, C.G.C.

Anoncodes melanura L. Leeds, August, 1919, W.D.H., *64.

Notoxus monoceros L. One specimen by searching at roots of plants in Flixton Sandpit, June, G.B.W. (an inland record).

Anthicus floralis L. var. † *formicarius* Goeje. East Ayton, G.B.W.

Anaspis geoffroyi Müll. Harewood and Leeds, C.G.C., *64.

Tetratoma fungorum F. Adel Dam, abundant, Nov., 37 specimens in one piece of fungus, T.B.K., *64. Leeds, March, 1920, C.G.C.

Hallomenus binotatus Quens. Seacroft, Aug., T.B.K., three specimens. This rare insect has previously been taken at Roundhay (E. W. Morse, 1909) and Cusworth (H. H. Corbett, 1907).

Tribolium confusum Duv. Scarborough, abundant in a bakery, G.B.W. *62.

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In addition to numerous interesting 'Yarns' in **The Tyke's Own Almanac, 1923, in the Yorkshire Dialect** (T. A. J. Waddington, Publisher, York, 106 pp., 6d.), the pamphlet is interesting from the archaic type of advertisements, relating to pills and cures for various ills, principally colds. For 7d., a young married woman can learn 'how to manage a husband'; there is an essence which will cure spavins, curbs, splints, sprains of the back sinews, calloused or hard swellings; cough linctus; books about herbs, horoscopes, 'donkey brand,' and so on.

Tales of Lonely Trails, by **Zane Grey**. London: Hodder & Stoughton, 394 pp., 15/- net. This author is evidently of the popular 'wild-west' type made familiar in this country on the American films, and his accounts of roping 'lions' which climb trees are certainly full of thrill, and we wish we could believe that the whole of his adventures, as recorded, actually occurred. It is a little difficult to understand why the author calls his book '*Lonely Trails*.' His own photograph, as frontispiece, is 'unattached,' but among the numerous plates throughout the book he is anything but lonely. On one he is 'on Don Carlos,' on another he is with a 'native' and he asks 'which is the Piute?' on still another he is with 'his men,' which include the bear hunter, pioneer Arizona guide, and many others.

Essentials of Zoology, by **Alexander Meek**. London: Longmans, Green & Co., xii.+325 pp., 10/6 net. Dr. Meek, as a result of his researches and teachings at the University of Durham, produces a scholarly volume, the object of which is evidently to aid students in the science of zoology. The illustrations form a very prominent feature, and are remarkable for their clearness. A factor which characterises the entire volume is the arrangement of the chapters, the careful selection of type for the sub-headings, and so on. There are a dozen chapters dealing with Protozoa, Coelenterata, Platyhelminia, Mollusca, Annelida, Crustacea, Insecta, Cephalochorda, Pisces, Amphibia, The Development of Birds and Mammals, and Mammalia. We can particularly recommend the volume to students of medicine and for first year students of science. The back of the title page bears the somewhat unusual imprint '*Made in Great Britain*.'

HUMBLE BEES AT ROUNDHAY, LEEDS.

A. E. BRADLEY.

IN *The Naturalist*, p. 14, I am quoted as saying that out of the twenty-three British *Bombi* I had taken twenty species at Roundhay. This should be 'Humble Bees,' the British species of which, as recognised by Sladen, comprise seventeen *Bombi* and six *Psithyri*.

The only three British species which I have not secured in this suburb of a large manufacturing town are:—(1) *B. lapponicus* Fab., which, though found in various Yorkshire localities, is mainly a mountain bee, and hardly to be expected; (2) *B. cullumanus* K., of which only a few males have been certainly recorded as British, all from the South Eastern Counties; and (3) *B. sylvarum* L., which occurs in the Wakefield district, and may even yet appear at Roundhay. As well as an exceptional number of species, this very limited area has yielded quite a number of marked varieties, and several can be added to these if one goes a mile or two farther afield. The *Psithyrus* varieties have all been recorded in *The Entomologist's Monthly Magazine*, June, 1922, and Jan., 1923, and include some novelties.

Though the best hunting grounds for Aculeates have recently been ruined one after the other by building operations and 'improvements,' the two latest additions to the list of Roundhay species (viz., *B. latreillellus* K. and *B. ruderatus* Fab.) were made as recently as May, 1922. All the twenty species have been seen quite lately, except *B. jonellus* K.; my last capture here (a queen) was in April, 1915, when several queens were also caught at Adel Dam, four miles away. *B. soroënsis* Fab. deserves a special note. During seven years all I saw of it was a single worker taken in the 'Canal Gardens' of Roundhay Park by Mr. A. Hodgson. In July and August, 1921, not only in Roundhay, but also in the Scarcroft and Collingham districts, almost every good patch of *Centaurea nigra* would yield some males or workers, or both. This very local bee also appeared in great numbers in 1921 in a district of the Cotswolds, which Dr. R. C. L. Perkins and his uncle, the late V. R. Perkins, both hymenopterists, had, between them, worked for fifty years without ever seeing it. It was abundant in the same year in Devon, and Mr. C. H. Mortimer found it extraordinarily so at Newhaven, Sussex, and at Aberdovey, Merionethshire. (My own experience in May-June, 1921, in West Carnarvonshire, where in several past years I had found the species quite common, was that the hibernated queens were very rare indeed; I only saw two in three weeks, both weather-beaten. Mr. C. L. Walton reports also, 'Sparingly in Carnarvon, 1921.') During 1922, not a single example of *B. soroënsis* could I find in the Leeds district.

YORKSHIRE GEOLOGY.

THE Annual Meeting of the Geological Section of the Yorkshire Naturalists' Union was held at Halifax on Saturday, October 14th. The venue of this meeting was chosen with the object of reviving geological interest in the district, and to enlist the services of local workers in the zoning of the Millstone Grit.

In 1898, James Spencer, of Halifax, pointed out that *Glyphioceras reticulatum*, one of the commonest of the goniatites found in this area, was passing through a series of changes in shape and ornamentation during its passage through the Millstone Grit (*Proc. Yorks. Geol. Society*, Vol. XIII., Pt. IV., pp. 375-394, 1899). Mr. Bisat has studied these variations, and now recognizes three mutations from the type form which is found in Crimsworth Dene. These mutations occur at successively higher horizons in the grits, and have been noted in a large area of the county south of the River Aire.

Two of these horizons were pointed out by Mr. Bisat during the afternoon excursion to Cat i' th' Well Clough.

The evening meeting was held in the Belle Vue Museum, Professor Gilligan presiding. After the reading of the report, and the election of Officials for 1923, Mr. Bisat gave an address on the zoning of the Millstone Grit, illustrating his remarks by specimens of goniatites. A discussion followed, in which the President, Mr. W. B. Wright, of the Geological Survey, Mr. J. W. Jackson, of Manchester, and others took part.

Mr. C. J. Spencer exhibited goniatites found in the neighbourhood of Halifax, and Mr. Rothwell sent collections from three separate localities near Sowerby Bridge. Mr. Bisat also had on view finely preserved specimens of one of the mutations of *G. reticulatum* from a boring at Saltaire.

Staying over the week-end, Mr. Bisat and the writer had an opportunity of examining a number of marine horizons in the Todmorden valley, in company with Messrs. Howe, Wright, and Lloyd, of the Geological Survey. Goniatites were found in five different localities, and sufficient material was collected to correlate the beds in this district with others north and south. The next Annual Meeting will be held at Bradford on October 13th, 1923.—J. HOLMES.

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Vol. XXIII. of *The Transactions of the Leicester Literary and Philosophical Society* contains Dr. Henry's Presidential Address on 'Medical Origins' and 'Astrology in Medicine' by Dr. A. L. MacLeod.

'Homoe-osis in *Coenonympha pamphilus* L.' by Dr. E. A. Cockayne; and 'Records from a South Hampshire Lepidopterist's Log-Book for 1920,' by A. T. Postans, appear in *The Entomologist* for January.

We have received the *Reports of the Moss Exchange Club*, Section II., for the years 1920 and 1921, and the Twenty-Seventh Annual Report for 1922, from the secretary. All interested in the distribution of mosses in this country, and in the identification of difficult species, should consult these reports.

Among the contents of the *Proceedings of the University of Durham Philosophical Society*, Part 3 of Vol. VI., recently received, we notice 'Blade Leakage in Reaction Steam Turbines,' by John Morrow; 'A New Theory of Laughter,' by J. X. T. Greig; and 'Plato's Development of the Socratic Paradox "That Vice is Involuntary,"' by Miss C. M. Shipley.

We have received *The Annual Report of the Chief Librarian and Curator of the Northampton Museum*, which indicates that considerable interest is being taken in the Museum and Art Gallery in that town, and, in addition to looking after the collections, the committee is paying attention to the renovation of the old buildings in which some of them are housed.

BIBLIOGRAPHY :

Papers and Records relating to the Geology of the North of England (Yorkshire excepted), published during 1922.

T. SHEPPARD, M.Sc., F.G.S.

- ANON. Northern Counties.
List of Mines in Great Britain and Ireland and the Isle of Man.
 398 pp.
- ANON. Northern Counties.
A Short Guide to the Museum of Practical Geology, Jermyn Street, London, S.W.1. Third ed., 44 pp.
- ANON. Northumberland, Durham, Yorkshire.
North-East Coast Building Stone [etc., Report]. *Quarry*, January, pp. 29-31; February, pp. 71-73; April, pp. 147-149; May, pp. 188-189; August, pp. 288-289; September, pp. 318-320; October, pp. 349-350; November, pp. 375-378.
- ANON. Durham, Derbyshire.
Origin of Fluorspar Deposits, tom. cit., June, pp. 219-221.
- ANON. Northern Counties.
British Quarries in 1921. Iron Ore. *tom. cit.,* December, pp. 398-401.
- ANON. Lincolnshire, Yorkshire.
The Press and Geology: A Vanishing Hill. *Nat.*, February, p. 53.
- ANON. Northern Counties.
Man and the Ice Age. *Nature*, November 4th, pp. 617-618.
- ANON. Northern Counties.
Geology of the North Sea Basin. *tom. cit.,* December 30th, pp. 890-891.
- ARBER, E. A. NEWELL Northern Counties.
Critical Studies of Coal-measure Plant-impressions. *Journ. Linn. Soc. Bot.*, October, pp. 171-217.
- BARKER, R. F. Lancashire, Cheshire.
Tunnelling in Water-Bearing Strata. *Trans. Liverpool Eng. Soc.*, Vol. XLII., pp. 145-191; abs. in *Water*, March, pp. 100-101.
- BELL, ALFRED. Durham, Yorkshire, Lincolnshire.
On the Pleistocene and Later Tertiary British Insects. *Ann. Rep. Yorks. Phil. Soc. for 1921*, pp. 41-51.
- BELL, ALFRED. Yorkshire, Lincolnshire.
Pleistocene and Later Birds of Great Britain and Ireland. *Nat.*, August, pp. 251-253.
- BENNETT, C. WILFRID. See STORR, FREDERICK.
- BISAT [W. S.]. Yorkshire, Lancashire.
[Geology of Clitheroe]. *Nat.*, July, pp. 225-226.
- BOLTON, HERBERT. Durham, Lancashire.
A Monograph of the Fossil Insects of the British Coal Measures. *Pal. Soc. Report for 1920*, pp. 81-156, pl. V.-X.
- BOULTON, W. S. Northern Counties.
Presidential Address [Winning Coal]. *Trans. Inst. Min. Eng.*, October, pp. 20-28.
- BROOKS, C. E. P. Northern Counties.
The Ice Age and Man. *Man*, May, pp. 75-76.
- BROOKS, C. E. P. Northern Counties.
The Evolution of Climate. London: 173 pp.
- CAINE, CÆSAR. Lake District.
The Port of Ravenglass. *Trans. Cumb. and Westm. Antiq. and Arch. Soc.*, N.S., Vol. XXII., pp. 101-107.

- CARUS-WILSON, CECIL. Lincolnshire.
Wind-borne Sand. *Conquest*, April, pp. 241-244.
- CHARLESWORTH, A. Yorkshire, Lincolnshire.
Geology at the British Association. *Nat.*, November, pp. 341-344.
- COLE, GRENVILLE A. J. Derbyshire, Northumberland.
Rocks and their Origins. 175 pp.
- CROSTHWAITE, PONSONBY MOORE. Lincolnshire.
The Louth Flood of 1920. *Water*, January, pp. 9-12, and *Trans. Inst. Water Eng.*, Vol. XXVI., pp. 204-227.
- DIXON, E. E. L. Lake District.
The Retreat of the Lake District Ice-Cap in the Ennerdale Area, West Cumberland. *Summary of Progress Geol. Surv. for 1921*, pp. 118-128.
- EADIE, T. See GRAHAM, J. IVOR.
- EARLE, KENNETH WILSON. Cumberland.
The Lower Carboniferous Rocks of West Cumberland [abs.]. *Abs. Proc. Geol. Soc.*, pp. 9-10; *Geol. Mag.*, November, pp. 523-526; *Nat.*, January, p. 3.
- EDMONDS, CHARLES. Cumberland.
The Carboniferous Limestone Series of West Cumberland. *Geol. Mag.*, February, pp. 74-83; March, pp. 117-131; *Rev. de Géol.*, Août, p. 492.
- ELLES, GERTRUDE L. Lake District.
The Graptolite Faunas of the British Isles: A Study in Evolution. *Proc. Geol. Assoc.*, June 23rd, pp. 168-200.
- ELLIOTT, G. F. SCOTT. Northern Counties.
Stories of Early British Life from the Earliest Times, 224 pp.
- ELSDEN, J. VINCENT and HOWE, J. ALLEN. Northern Counties.
The Stones of London. *Quarry*, August, pp. 277-279; abs. in *Nat.*, January, p. 8.
- FAIR, MARY C. See PARKER, CHARLES A.
- FLETT, JOHN S. Northern Counties.
Report of the Director of the Geological Survey and Museum for 1921. *Summary of Progress*, 189 pp.
- FORREST, N. See GRAHAM, J. IVOR.
- FRENCH, ALEXANDER. See GRAHAM, J. IVOR.
- FRENCH, JAMES WEIR. Durham.
Columnar Structure in Sandstone Walls of a Glass Furnace. *Nature*, March 2, p. 274.
- GIBSON, CHARLES R. Northern Counties.
The Romance of Coal. London: 310 pp.
- GILLIGAN, A. Cumberland.
Sandstone Dykes or Rock-Riders in the Cumberland Coalfield [abs.]. *Brit. Assoc. Journ.* (Hull), pp. 22-23.
- Furness, Lake District.
- GRACE, GEOEGE and SMITH, FREDERICK HOWARD.
Some Observations on the Glacial Geology of Furness. *Proc. Yorks. Geol. Soc.*, December, pp. 401-419; see also *Geol. Mag.*, June, pp. 282-283.
- GRAHAM, J. IVOR. Cumberland, Derbyshire, Yorkshire.
Rock-temperatures in the Coal-Measures of Great Britain (fourth report to the Committee on 'The Control of Atmospheric Conditions in Hot and Deep Mines') [with contributions by J. T. Storrow; J. Walters; C. B. Platt; Alexander French; T. T. Thyne; R. A. Passmore; N. Forrest; L. Holland; T. Eadie]. *Trans. Inst. Min. Eng.*, Vol. XLIII., pt. 5, pp. 343-399.

- GRAHAM, T. H. B. Lake District.
The Eastern Fells. *Trans. Cumb. and West. Antiq. and Arch. Soc.*,
 N. S. Vol. XXII., pp. 44-72.
- GREGORY, J. W. Northern Counties.
The English 'Eskers'—their Structure and Distribution. *Geol.*
Mag., January, pp. 25-44.
- HERBERT, S. Northern Counties.
List of Forges in England and Wales, c. 1750. *Geog. Teacher*, No.
 64, pp. 389-390.
- HEWITT, W. Cheshire.
The Wirral Peninsula: an Outline Regional Survey. Liverpool,
 300 pp.
- HOLLAND, L. See GRAHAM, J. IVOR.
- HOWE, J. ALLEN. See ELSDEN, J. VINCENT.
- JACKSON, J. WILFRID. Derbyshire.
Daviesiella llangollensis (Dav.) in Derbyshire. *Geol. Mag.*, July,
 p. 335.
- JACKSON, J. WILFRID. Derbyshire.
On the Occurrence of Daviesiella llangollensis (Dav.) in Derbyshire.
Geol. Mag., October, pp. 461-468.
- JACKSON, J. WILFRID. Lancashire, Derbyshire, Yorkshire.
Objects from Caves. *Lancs. and Cheshire Nat.*, October, pp. 81-83.
- JONES, LL. RODWELL. Northern Counties.
Commodity Maps. *Geog. Teacher*, Vol. 62, Pt. 4, pp. 223-232.
- KENDALL, PERCY FRY. Northern Counties.
**The Physiography of the Coal Swamps [Presidential Address to
 Section C (Geology)].** *Adv. of Science*, pp. 1-30; abs. in *Dis-*
covery, November, p. 303; *Nature*, December 16, pp. 811-814.
- KENDALL, P. F. Northern Counties.
The Geological History of the North Sea Basin. *Geol. Mag.*,
 December, pp. 557-560; abs. in *Brit. Ass. Journ.* (Hull), pp. 20-21.
- KENDALL, PERCY F. Northern Counties.
Man and the Glacial Period. *Nat.*, February, pp. 67-68.
- KENDALL, P. F. Northern Counties.
**The Porosity of Rocks and its Influence upon the yield of Wells
 and Boreholes.** *Trans. Inst. Water Eng.*, Vol. XXVI., pp. 28-43.
- KENNEDY, NIGEL W. Lancashire S., Cheshire.
The Natural Panning of Minerals in Littoral Deposits. *Proc.*
Liverpool Geol. Soc., Vol. XIII., Pt. 3, pp. 161-165.
- KERR, GEORGE L. Northern Counties.
Practical Coal Mining, eight ed., 789 pp.
- KIDSTON, R. Northumberland, Durham.
**List of Fossil Plants from the Upper Carboniferous Rocks of the
 Northumberland and Durham Coalfield, and their bearing on
 the Age of the Coalfield.** *Summary of Progress Geol. Surv.* for
 1921, pp. 129-145.
- KITCHIN, F. L. and PRINGLE, J. Lincolnshire, Yorkshire.
**On the overlap of the Upper Gault in England and on the 'Red
 Chalk' of the Eastern Counties.** *Geol. Mag.*, April, pp. 156-166;
 May, pp. 194-200.
- LAMPLUGH, G. W. Durham, Yorkshire.
The Raised Beach at Easington. *Geol. Mag.*, March, pp. 143-144.

72 *Bibliography: Geology of the North of England.*

- LEWIS, L. HOLME. Lancashire S., Lake District.
Manchester Corporation Waterworks: Haweswater Scheme.
Trans. Inst. Water Eng., Vol. XXVI., pp. 130-171.
- MILTON, H. EUSTACE. Nottinghamshire.
The Eastern Extension of the Nottinghamshire Coalfield. *Trans.*
Inst. Min. Eng., March, pp. 115-120.
- MITCHELL, C. AINSWORTH. Lake District.
Pencil Markings in the Bodleian Library. *Nature*, April 22nd,
 pp. 516-517.
- NEWTON, CECIL. Lancashire S.
**Heating of the Goaf and the steps taken in conjunction therewith,
 at Chanters Colliery.** *Trans. Inst. Min. Eng.*, March, pp. 70-82.
- NEWTON, CHARLES BUTTERWORTH. Northern Counties.
**Presidential Address: Water Supply and Geology of the Humber
 Basin.** *Trans. Inst. Water Eng.*, Vol. XXVI., pp. 10-27.
- NEWTON, CHARLES BUTTERWORTH. Northern Counties.
The Waterworks of the Corporation of the City of Hull. *tom. cit.*
supplement, pp. 1-13.
- OGILVIE, F. G. Northern Counties.
Report of the Survey Board for 1921. *Summary of Progress Geol.*
Surv. for 1921. 189 pp.
- PARKER, CHARLES A. and FAIR, MARY C. Lake District.
Bloomery Sites in Eskdale and Wasdale. *Trans. Cumb. and West.*
Antiq. and Arch. Soc., N.S., Vol. XXII., pp. 90-97.
- PARSONS, L. M. Derbyshire.
Dolomitization in the Carboniferous Limestone of the Midlands.
Geol. Mag., February, pp. 51-63; March, 104-117.
- PASSMORE, R. A. See GRAHAM, J. IVOR.
- PEAKE, HAROLD. Northern Counties.
The Ice Age and Man. *Man*, January, pp. 6-11.
- PHILPOTT, HUGH B. Derbyshire, Yorkshire.
**Manchester Royal Exchange: a Fine Exterior of Darley Dale
 Stone.** *Quarry*, January, pp. 9-10.
- PHILPOT, HUGH B. Derbyshire.
**War Memorial Chapel at St. Michael's, Chester Square: The
 Charm of Hornton Stone.** *Quarry*, August, pp. 280-281.
- PLATT, C. B. See GRAHAM, J. IVOR.
- PRESTON, H. Lincolnshire.
Geological Report, 1921 [Frieston Shore]. *Lincs. Nat. Union*
Trans., 1921, pp. 160-161.
- PRESTON, HENRY. Lincolnshire.
Creep. *Trans. Leeds Geol. Assoc.*, pt. 18, pp. 7-8.
- PRINGLE, J. See KITCHIN, F. L.
- REID, E. M. Durham.
Note on the Hollow Curve as shown by Pliocene Floras [abs.].
Linn. Soc. Circ., No. 397, pp. 3-4.
- REID, ELEANOR M. Durham.
Fossil Buttercups. *Nature*, February 2nd, p. 136.
- REYNOLDS, SIDNEY H. Derbyshire, Lincolnshire, Yorkshire.
A Monograph of the British Pleistocene Mammalia, Vol. III., Pt.
 I, *Hippopotamus.* *Pal. Soc. Report for 1920*, pp. 1-38, pl. I-VI.
- REYNOLDS, S. H. [Secretary]. Cumberland, Westmorland, Yorks.
**Photographs of Geological Interest—Twentieth Report of Commit-
 tee.** *Rep. Brit. Assoc. for 1921*, pp. 251-260.

- RICKERBY, J. Northumberland, Durham.
The Newcastle Grindstone Industry. *Quarry*, January, pp. 11-16.
- SARTON, GEORGE. Northern Counties.
Tenth Critical Bibliography of the History, Philosophy and Organisation of Science and the History of Civilization. *d'Isis*, No. 10, Vol. IV., pp. 124-220.
- SCOTT, ALEXANDER. Derbyshire, Nottinghamshire.
Mineralogy [abstracts]. *Science Progress*, July, pp. 45-47.
- SHEPPARD, T. Northern Counties.
List of Papers Bearing upon the Zoology, Botany, and Prehistoric Archæology of the British Isles, issued during 1920. *Rep. Brit. Assoc. for 1921*, pp. 499-549.
- SHEPPARD, T. Lincolnshire, Yorkshire.
The Hull Museum of Natural History, Antiquities and Applied Art: Its History and Collections. *Hull Mus. Pub.*, No. 130, 12 pp.
- S[HEPPARD], T. Cumberland, Derbyshire.
West Cumberland Rocks, Lake District or Ireland: An Old Geological Section. *Shap Granite. Nat.*, January, pp. 3, 6, 8.
- S[HEPPARD], T. Lincolnshire.
Remains of False Killer (*Pseudorca crassidens*) in Lincolnshire. *tom. cit.*, January, p. 18.
- S[HEPPARD], T. Yorkshire.
Mammoth Tooth from Auburn, East Yorks. *tom. cit.*, January, p. 20.
- S[HEPPARD], T. Derbyshire.
Palæolithic Man. *tom. cit.*, March, pp. 97-102.
- SHEPPARD, T. Northern Counties.
Bibliography: Papers and Records relating to the Geology of the North of England (Yorkshire excepted) published during 1921. *tom. cit.*, April, pp. 133-136; March, pp. 165-170.
- SHEPPARD, T. Lincolnshire.
Remains of Whooper Swan, etc., in the Peat of Lincolnshire. *tom. cit.*, June, p. 199.
- SHEPPARD, T. Lincolnshire.
Large Ammonite at South Ferriby, *tom. cit.*, p. 201.
- S[HEPPARD], T. Lincolnshire.
The Kirmington Deposits. *tom. cit.*, August, pp. 255-256.
- SHERLOCK, R. L. Northern Counties.
Man as a Geological Agent: an account of his action on Inanimate Nature. London, 372 pp., see *Water*, October 20, pp. 351-352; *Nat.*, January, 1923, p. 5.
- SINNATT, F. S. Lancashire S.
A Method of Representing the Structure of Coal-Seams and their Proportion and Properties of the Four Constituents (Vitrain, Clarain, Durain and Fusain) contained in certain seams.— Part I. *Trans. Inst. Min. Eng.*, Vol. LXIII., pt. 4, pp. 307-317.
- SMITH, BERNARD. Cumberland.
Boring for Coal near Maryport (Cumberland) [abs.]. *Rev. de Géol.*, Juin, p. 358.
- SMITH, B. Derbyshire, Nottinghamshire.
Brecciated Gypsum of Chellaston: Micro-examination of Rock-Gypsum [abs.]. *Sci. Prog.*, July, pp. 45-47.
- SMITH, F. H. See GRACE, GEO.

- SOLLAR, W. J. Northern Counties.
Shell-Structure of Foraminifera [abs.]. *Nature*, April 1, p. 424.
- SPATH, L. F. Lincolnshire, Yorkshire.
On Lower Lias Ammonites from Skye. *Geol. Mag.*, April, pp. 170-176.
- SPENCER, W. K. Westmorland.
A Monograph of the British Palæozoic Asterozoa, part 5. *Pal. Soc. Rep. for 1920*, pp. 197-236; pl. XIV.-XVII.
- STAMP, L. DUDLEY. Northern Counties.
Geologie Glaciaire [review of papers on]. *Rev. de Géol.*, Août, pp. 488-490.
- STORR, FREDERICK and BENNETT, C. WILFRID. Cheshire.
Chester Waterworks, Past and Present. [Abs.]. *Water*, June, pp. 193-199.
- STORROW, J. T. See GRAHAM, J. IVOR.
- THACKER, S. L. Lancashire S., Yorkshire.
Departmental Committee on Spontaneous Combustion of Coal in Mines: Digest of the Investigations and Reports. *Trans. Inst. Min. Eng.* April, pp. 121-155.
- THYNE, T. T. See GRAHAM, J. IVOR.
- TRAVIS, W. G. Lancashire S., Cheshire.
On Peaty Bands in the Wallasey Sandhills. *Proc. Liver. Geol. Soc.*, Vol. XIII., pt. 3, pp. 207-214; abs. in *Geol. Mag.*, April, p. 188; *Nat.*, June, p. 178.
- TRUEMAN, A. E. Nottinghamshire.
The Use of Gryphaea in the Correlation of the Lower Lias. *Geol. Mag.*, June, pp. 256-268.
- WALKER, W. T. Lancashire S., Cheshire.
President's Address [Geology in a Great Port]. *Proc. Liverp. Geol. Soc.*, Vol. XIII., Pt. 3, pp. 147-158.
- WALTERS, J. GRAHAM, J. IVOR.
- WARD, E. M. Northern Counties.
English Coastal Evolution. London, 262 pp.
- WEGENER, ALFRED. Northern Counties.
The Origin of Continents and Oceans. *Discovery*, May, pp. 114-118.
- WEIGHALL, A. Durham.
Durham Coal, Agglutinating Value of [abs.]. *Bull. Cleveland Tech. Inst.*, January, p. 27.
- WELLS, R. G. Lancashire S., Cheshire.
Bacteria from the Geological Aspect. *Pros. Liver. Geol. Soc.*, Vol. XIII., pt. 3, pp. 218-229.
- WHITAKER, E. D. Lake District, Cheshire, Yorkshire.
Peat Problems. *Trans. Leeds Geol. Assoc.*, pt. 18, p. 23.
- WHITEHEAD, W. A. Isle of Man.
Note on some Fractured Pebbles from Point Cranstal, I.O.M. *Proc. Liver. Geol. Soc.*, Vol. XIII., pt. 3, pp. 215-217; abs. in *Geol. Mag.*, April, p. 188.
- WOOLACOTT, DAVID. Durham.
On the 60-ft. Raised Beach at Easington, Co. Durham. *Geol. Mag.*, February, pp. 64-74; abs. in *Rev. de Géol.*, Août, p. 501.
- WRAY, D. A. Lancashire S.
On a Boring at Bootle, near Liverpool. *Summary of Progress, Geol. Surv. for 1921*, pp. 159-161.

FIELD NOTES.

Rat-Tailed Opossum (*Didelphys nudicaudata*) in Hull.—A fine specimen of this animal was recently captured in a warehouse in Finkle Street, Hull, in a rat trap. It had probably been imported with fruit.—C. W. MASON.

***Schizophyllum commune* in S. W. Yorks.**—Of this species (see *The Naturalist*, p. 24), I identified five examples growing in a dolly-tub at Wath-on-Dearne, August 23rd, 1921. The first Yorkshire records of it appear in *The Naturalist*, March 1904, p. 89.—J. H. PAYNE.

Abnormal Three-Bearded Rockling.—On December 26th, 1922, a nearly full-grown example of the Three-Bearded Rockling (*Motella vulgaris*) of Cuvier, measuring 15 inches in length, was caught by an angler fishing from Filey Brig.

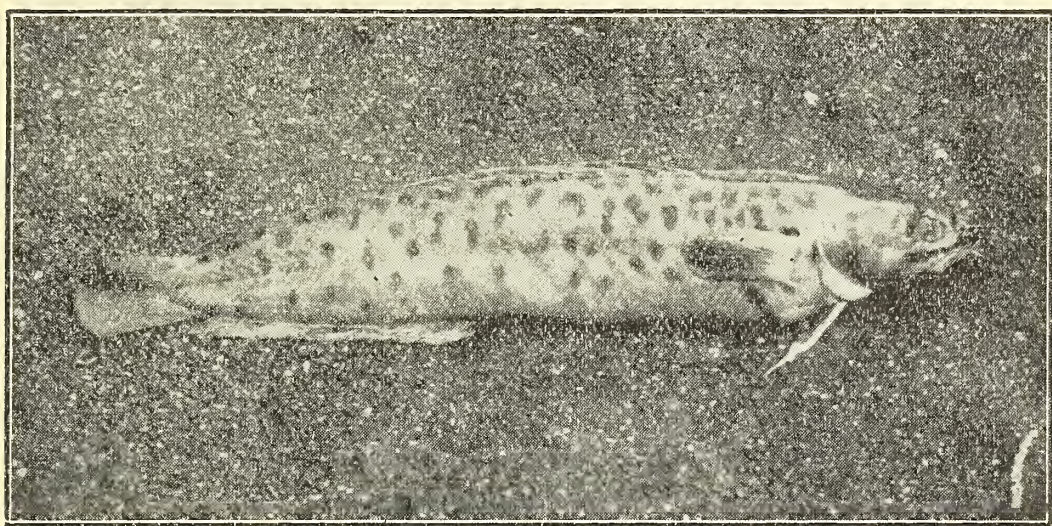


Photo by]

Adult normal three-bearded Rockling.

[W. J. Clarke.

This fish was remarkable in not having assumed the colour usually borne by the adults, which is a rich yellowish-brown ground marked with numerous chestnut brown spots. It was almost of a uniform deep chocolate-brown colour, a little lighter beneath than on the back. The young individuals of this species, up to a length of about six or seven inches, are sometimes to be found in the rockpools on the Yorkshire coast, and are normally of this brown colour, but above this size the characteristic marking of the adult is assumed. As the length of this species seldom exceeds seventeen inches, the specimen was practically full grown, and should have borne the spotted dress of the adult fish. Farrell refers to one 'fourteen inches long and beautifully spotted.' I have not seen a similarly coloured adult example, and it is to be regretted that this one could not have been secured for preservation.—W. J. CLARKE.

REVIEWS AND BOOK NOTICES.

The Fishing Industry, by W. E. Gibbs. London: Pitman & Sons, viii., + 135 pp., 3/- net. The publishers are to be congratulated on having produced so interesting a volume dealing with an industry which is of far more importance to the country than is usually supposed. The book is well illustrated, and Dr. Gibbs has a happy knack of giving his story in a very readable form.

From the well-known firm of R. and J. Beck has been issued **The Microscope** (144 pp.). In this the various parts of the microscope are illustrated and described in detail, and there is a chapter on The Microscope as a Recreation, and a list of the prices of instruments and apparatus. The volume is well bound, and at the exceptionally low price of 2/6 should have a ready sale, and no doubt the words '1st Edition' on the title page will soon require altering.

Hadrian's Wall, by Jessie Mothersole. London: The Bodley Head, xix. + 248 pp., 8/6 net. Those who have had an opportunity of seeing the excellent collection of water colours recently exhibited in the Walker Galleries, London, will be glad to see a number of them beautifully reproduced in colours in the present volume, in which the artist-author has a chatty account of her visit to the Roman Wall, and gives a map and other information likely to be of service to the tourist.

Goldsborough: The Church and the Hall, by W. A. Atkinson. Knaresborough: Parrs, Ltd., 78 pp., 2/6 net. This is a well-printed Handbook describing one of the fine country houses in the North of England; is well illustrated, and will no doubt appeal to many who are interested in the topography of our greatest county. The volume appears at a rather appropriate moment, seeing that Goldsborough Hall is, according to the circular, 'Princess Mary's Yorkshire Home,' and also, incidentally, that of Viscount Lascelles.

Modern Microscopy, by M. I. Cross and M. J. Cole. London: Bailliere, Tindall & Cox. The microscope still continues to play its part, and evidently is able to fascinate a growing number of amateur devotees. Recently has been published the 5th Edition of this well-known volume, which has been revised and re-arranged by Herbert F. Angus. Seeing that it is excellently bound, well illustrated and contains over 300 pages, has various appendices of value, it will be understood that the price of 10/6 net is remarkably cheap.

Reptiles of the World, by R. L. Ditmars. New York: Sturgis & Walton; London: Macmillan & Co., xi. + 373 pp., \$5.00 (18s.) net. The title of this work seems to suggest rather a large order, but a perusal of the book shows that it is justified, and there are 90 plates of reproductions of photographs of typical reptiles from various parts of the globe. The author's position as Curator of Reptiles in the New York Zoological Park particularly qualifies him for the task he has undertaken, and he seems to have carried out his work well.

On some Antiquities in the Neighbourhood of Dunecht House, Aberdeenshire, by Rev. Bishop G. F. Browne. London: Cambridge University Press, xiv. + 170 pp., 63/- net. In the elaborate and sumptuous manner which we have come to expect from the Cambridge University Press, this volume has appeared. The author was formerly Professor of Art and Archæology in the Cambridge University, and is peculiarly fitted for the very difficult task he has undertaken, as the district he describes is full of knotty problems over which many archæologists have stumbled. There are over 60 plates upon which numerous prehistoric rock structures are depicted, and particular prominence is paid to the extraordinary series of rock carvings which that district has produced. Some of these certainly seem difficult of explanation, the meaning of others, however, is more apparent. The author deals with Druidism, Pagan Worship, Stone Circles, Astronomical Observatories; he gives remarkably clear descriptions of these and of various sandstone and sculptured stones, star charts, etc.

Flowering Shrubs and How to Know Them, by S. C. Johnson, D.Sc. London: Holden & Hardingham, 1922, 1s. net. This little pocket volume is No. 14 of 'The Nature Lover's Library,' and follows similar lines to previous volumes. Its aim is to enable anyone interested in flowering shrubs to identify those most commonly found in hedgerows and shrubberies. It thus includes wild species, but many commonly cultivated in gardens. The species are briefly described in simple non-technical language, and fifty-one kinds are illustrated by small figures of the leaves and flowering shoots.

Practical Zoology, by Professor J. D. F. Gilchrist and C. Von Bonde. Edinburgh: E. & S. Livingstone, xi.+329 pp., 15/- net. This remarkably cheap volume has been specially prepared for Zoological students in South Africa, and the types selected for study are suitable for that area. The pages are large, $9\frac{3}{4}$ ins. by 7 ins., and the letterpress is printed on one side only, leaving the opposite blank for notes, etc. The illustrations are well drawn and specially selected for the use of medical students, and in practically every case are original and have been made from actual dissections. South African students are indeed fortunate in having so useful and handy a textbook.

The Geological Story of the Isle of Wight, by Rev. J. Cecil Hughes. London: E. Stanford, Ltd., viii.+115 pp., 2/6. This is a popular account of the geology of the Isle of Wight, which, presumably from its size and price, may appeal to those who do not care to obtain the new edition of Osborne White's *Geology of the Isle of Wight*, issued by the Geological Survey. The volume describes the geology of the island. There are reproductions of photographs, maps, illustrations of typical fossils, etc. There is a small coloured geological map at the end. The main complaint we have to make in reference to the book is the systematic way in which the author puts capital letters for trivial names.

Fishing in Eden, by William Nelson. London: H. F. & G. Witherby, 208 pp., 12/6 net. This is 'a record of fifty years with rod and line in the valleys of the Eden and Eamont; to which are added some practical notes on flies and tackle,' a sub-title which defines the scope of the book. The author is a particularly practical angler, and gives a wealth of illustration of the localities in which he has spent many glorious hours. Others indicate his interest in the historic side of the subject, and his frontispiece is a coloured illustration of 35 different alluring and tempting 'flies.' The author has a very pleasing style, his book is full of narrative, and his fish stories are convincing. On one plate he gives one of the finest views of High Cup Nick, 'The birthplace of a Beck,' that we have seen.

The Evolution of Climate, by C. E. P. Brooks. London: Benn Brothers, 173 pages. We had an insight into Mr. Brooks' methods in a paper which was printed a little while ago in *The Meteorological Journal*. He has now extended his observations, and in a series of nineteen chapters gives the results of his studies in 'geology, anthropology and meteorology, and he has considerable mathematical ability. By applying the latter to the results of his studies he has developed a theory for the cause of climatic changes based on changes of land and sea area, and on changes of elevation of land surfaces, and naturally he has made this theory the basis of his work. That there will be some who are not able to agree with him as to the sufficiency of the causes he invokes, or who may even question whether he also has not taken for granted what others dispute, goes without saying; but all will agree that he has presented a difficult subject in a clear and concise way, and that meteorologists (and may I add geologists?) owe to him a deep debt of gratitude' we learn from Dr. G. C. Simpson's preface. The author has made a special study of the past so far as geological evidence is available, and his volume is worth careful perusal.

NEWS FROM THE MAGAZINES.

Dr. R. F. Scharff writes on 'The Wolf in Ireland' in *The Irish Naturalist* for December.

Mr. R. J. Pocock has an illustrated article on 'The Evolution of the Elephant' in *Conquest* for January.

The Scientific Pictures of Joseph Wright are illustrated and described by F. W. Shurloch in *Science Progress* for January.

A report of the discussion on 'The Geology of the North Sea Basin,' which took place at the Hull Meeting of the British Association, occurs in *Nature*, No. 2774.

Nature, No. 2773, contains a supplement devoted to Pasteur, by various authors, in commemoration of the fact that this year is the centenary of his birth.

The Journal of the Ministry of Agriculture for January includes an article on 'The Wild Rabbit,' by Professor J. A. Thomson; and Notes on the Patrington Farm Settlement.

The Quarterly Journal of the Geological Society No. 312 contains 'The Pliocene Deposits of Cornwall,' by H. B. Milner; and 'Certain Jurassic Strata near Eypesmouth, Dorset,' by S. S. Buckman.

The Museums Journal for January contains an excellent Memoir and Portrait of the late Lord Sudely; 'Museum Labelling and Printing,' by A. T. Roberts, and many other items of interest to Museum Curators.

We learn from *The Museums Journal* that the authorities at the Manchester Museum has been asked whether they have any 'bat's eggs' in the collections. *Punch* will have to keep his eye on *The Museums Journal*!

An account of the curious way in which Spring-tails attack Mangolds, a paper on the Improvement of Moorland Grazing in the North of England, and another on Liquorice Growing, occur in *The Journal of the Ministry of Agriculture* for December.

Among the contents of *The Journal of the Quekett Microscopical Club*, No. 88, we notice 'The Oxford University Expedition to Spitsbergen, 1921,' by J. S. Huxley; 'A Species of Hydracarina found at Bear Island,' by C. D. Soar; and 'On Some Rotifera from Spitsbergen,' by D. Bryce.

An admirable leading article on 'A Suggested Royal Commission on Museums' appears in *Nature*, No. 2771; and No. 2772 of the same journal has a critical review of 'Wegener's Drifting Continents,' by Prof. Grenville A. J. Cole; and 'The Physiography of the Coal Swamps,' by Prof. P. F. Kendall.

Writers in *British Birds* for January have been counting the feathers in nests of Long-tailed Tits, and seven nests examined have yielded numbers varying from 2457 to 835. In the same journal J. Walpole-Bond writes 'Concerning the Greenshank'; N. H. Joy, 'Some Migrants in Berkshire'; and Miss Frances Pitt on 'The Arctic Skua.'

The Scottish Naturalist for November-December, No. 131-132—[confound these double numbers!]
—contains an Obituary notice of William Evans; 'Notes on the Wood Wasps Occurring in Scotland,' by the late W. Evans; 'The Raven in the Lammermoors,' by W. M. Conachie and the 'Great Waxwing Invasion of 1921,' by James Ritchie.

In *The New Phytologist* for December we find 'The Influence of External Conditions on the Intake and Excretion of Water by Plant Cells and Tissues,' by W. Stiles; 'Physiological Studies in Plant Anatomy,' by J. H. Priestley and L. M. Woffenden; 'The Structure and Functions of the Endodermis in the Leaves of the Abietineæ,' by I. Soar; and 'The Origin of the Hybrid *Primula elatior* × *vulgaris* demonstrated experimentally in the Field, with notes on other British *Primula* Hybrids,' by Miller Christy.

NORTHERN NEWS.

A recent Sunday newspaper illustrates 'The making of whalebone for "My Lady's" figure,' and gives a picture of 'the bones, or fins, being sorted out.'

After nearly 20 years as superintendent of Zoological Gardens, Mr. R. I. Pocock is to retire in March, when he attains the age of 60. He will be succeeded by Dr. Geoffrey Marr Vevers.

'Fungi and Diseases of Crops' is the title of a paper appearing as Publication No. 79 of the Belfast Municipal Museum. It is written by the Curator, Mr. Arthur Deane, is well illustrated, there are 24 pages, and it is sold at one penny.

A photograph of the Mammoth Tusk said to be 50,000 years old and described as 'Mammoth's Mighty Molar,' appears in *The Northampton Independent* for December 30th. The tusk (not molar) is evidently in a very fragmentary condition.

At a recent meeting of the Linnean Society of London, three valuable contributions were given, namely, '*Festuca rubra* in Britain'; 'British Species of *Calamintha*'; and 'The Genus *Polysiphonia*: a Critical Revision of the British Species, based upon Anatomy.'

A collection of British birds owned by Mr. J. M. Naylor, Leighton Hall, Welshpool, has been acquired for presentation to the Swansea Museum. This collection was made by Mr. Naylor's grandfather, and is said to contain specimens of every species of native or migratory bird found in the British Isles.

From an urgent and personal appeal to buy bulbs from a Dutch firm, we learn 'What would life be without love, what would it be without flowers? Another question is quality and . . . price. Words fail to describe their loveliness. Bulbs for naturalization. We praise ourselves happily if we can make both ends meet.'

There are no Yorkshire specimens figured in Part 37 of Buckman's *Type Ammonites*. Among the plates are *Ammonites biplex*, the new name of which apparently is *Paravirgatites paravirgatus* S. Buckman, *Paravirgatitan paravirgatus*; *A. triplicatus* = *Lydistratites lyditicus* nov. *Paravirgatitan lyditicus*, and our old friend *A. koenigi* = *Proplanulites trifurcatus* S. Buckman, *Proplanulitan opimus*.

The Council of the Geological Society has this year made the following awards: Wollaston Medal, W. Whitaker, B.A., F.R.S.; Murchison Medal, John Joly, D.Sc., F.R.S.; Lyell Medal, Gustave F. Dollfus; Bigsby Medal, Edward Battersby Bailey, M.C., B.A.; Wollaston Fund, Herbert Harold Read, B.Sc.; Murchison Fund, Thomas Henry Withers; Lyell Fund, William Thomas Gordon, M.A., D.Sc., and William Noel Benson, B.A., D.Sc.

We learn from the press that 'among the discoveries of Calcareous Algæ which are being shown at the Exhibition of Scientific Novelties, London, Professor Garwood found in Westmorland a type with an unusual bulgy appearance. One of his students hit on the obvious name. "Algy met a bear, the bear was bulgy, the bulge was Algy." Hence "Algæ Bulgæ." It is certainly brighter than "Spongiostroma," by which the specimen is officially known.'

The British Association for the Advancement of Science announces that for the meeting of the Association, which will be held in Liverpool from September 12th to 19th, under the Presidency of Sir Ernest Rutherford, the following have been appointed sectional presidents. :—Section A (Mathematics and Physics), Professor J. C. M'Lennan; B (Chemistry), Professor F. G. Donnan; C (Geology), Dr. Gertrude Elles; D (Zoology), Professor J. H. Ashworth; E (Geography), Dr. Vaughan Cornish; F (Economics), Sir W. H. Beveridge; G (Engineering), Sir Henry Fowler; H (Anthropology), Mr. P. E. Newberry; I (Physiology), Professor G. H. F. Nuttall; J (Psychology), Mr. C. Burt; K (Botany), Mr. A. G. Tansley; L (Education), Professor T. P. Nunn; M (Agriculture), Professor C. Crowther.

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STATEMENT OF INCOME AND EXPENDITURE, 12 months to November 28, 1922.

INCOME.				EXPENDITURE.			
	£	s.	d.	£	s.	d.	
Members' Annual				Expenses of Meetings ...	8	12	1
Subscriptions, arrears	9	19	6	Postages, etc. (Hon. Secretaries' A/c)	13	12	6
" 1922	105	12	0	Clerkage,	1	12	0
" 1923	5	3	6	Printing and Stationery (General A/c)	42	18	9
			120 15 0	" (Hon. Treasurer's A/c)	3	6	3
Life Members' Subscriptions (contra)			3 3 0	Postages, etc.	1	16	8
Levies from Associated Societies, arrears	0	16	0				
" 1922	8	11	0				
			9 7 0				
	£	s.	d.				
NATURALIST':—				PUBLICATIONS:—			
Subscriptions, arrears	13	2	6	Annual Report, 1921 ...	14	1	0
" 1922	127	2	0	" (est.) 1922	15	0	0
" 1923	6	7	6		29	1	0
			146 12 0	Less Provision in A/cs, 1921	15	0	0
Bank Interest ...			2 7 10				14 1 0
Transferred from Life Members' A/c ...	25	0	0				
					£	s.	d.
Balance, being Excess of Expenditure over Income ...			50 3 9	'NATURALIST':—			
				Members' Copies ...	209	2	6
			£357 8 7	Exchanges ...	6	5	0
				Editor's Postages, etc. ...	10	0	0
				Extra pages ...	23	15	0
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							£357 8 7

BALANCE SHEET, November 28, 1922.

LIABILITIES.				ASSETS.			
	£	s.	d.		£	s.	d.
Amounts owing by Union—				Cash at Bank ...	128	12	11
'Naturalist' ...	127	3	10	Cash in hands of Hon. Secs.	0	14	1
Hon. Treasurer ...	0	16	5				129 7 0
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Annual Report, 1922 (estimate) ...			15 0 0	£100 (Feb. 12/17) cost			
Subscriptions received in advance ...			11 11 0	£77 10s.; present value, say ...	104	0	0
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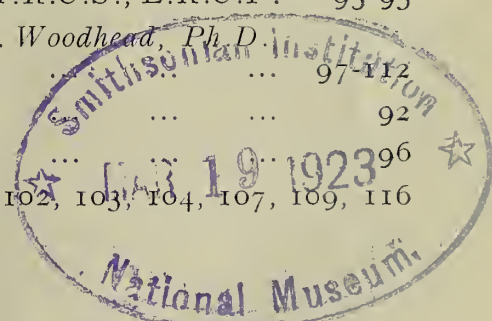
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BRYOLOGICAL SECTION.

Easter Week-end, March 30th-April 2nd, Excursion to Austwick.

Outings will be arranged, depending on the weather, to Ingleboro', Trow Gill, Arcow Wood, Austwick Moss, Oxenber Wood, etc.

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NOTES AND COMMENTS.

WEST HAM.

We see from an announcement by Mr. George E. Hilleary, Town Clerk, that 'applications are invited for the position of Full Time Assistant in the Essex Museum of Natural History from persons having a practical knowledge of Museum Work. Applicants should have had some biological training, and must be experienced in taxidermy and be able to mount and set up specimens and prepare dissections for exhibition, and should be capable of preparing diagrams, drawings and taking photographs to illustrate exhibits. The possession of a Science Degree of a British University, although desirable, will not be considered essential if other qualifications are satisfactory. The salary will be at the rate of £150 per annum plus Civil Service Award.' We certainly think the 'successful' candidate should be an F.R.S. and wear white spats. We wonder what the Sanitary Inspector at West Ham earns.

EDIBLE MOLLUSCA.

In *The Journal of Conchology* for January, Mr. E. W. Swanton writes on 'The Edible Mollusca of the British Isles.' He quotes Mr. H. Toms to some length, who describes numerous examples of *Helix* (*arbustorum*, *nemoralis* and *hortensis*) as occurring in Yorkshire barrows, and states 'hence it is probable that this species was eaten in very early times.' Personally we consider that the word 'probable' is unsuitable and even the word 'possible' would be too strong. Those familiar with excavations, especially in districts which formerly have been well wooded, know how easily land shells penetrate into the earth, occasionally being aided by rabbits, etc. The fact that the late J. R. Mortimer found shells during his excavations of different barrows, usually mixed up indiscriminately with the earth of which the barrows were built, merely indicates that these particular species either may have been on the ground at the time the barrows were made, or have found their way in during comparatively recent times. Personally we think that Yorkshire has not produced the slightest scrap of evidence that these species were formerly used as food, and we should want a little more evidence than that produced by Mr. Swanton before we accepted it for other areas.

THE OLD ENGLISH HERBALS.*

Collectors of old books have long been familiar with the extraordinary publications issued under the general title of Herbals, with the quaint descriptions of the ways in which various plants can be put to a variety of uses; and those

* By E. S. Rohde. London: Longmans, Green & Co. xii. + 243 pp. 21/- net.

with a botanical bent must have marvelled at the sketches and descriptions of trees, shrubs and other plants appearing in some of these early works by Gerard, Parkinson, Culpeper, and many others familiar to most collectors. In the present treatise, however, the author takes us back to the days of the early illuminated records in Anglo-Saxon times, where the 'Leech-books' were illustrated, and reproductions occur of such subjects as 'Herbs being dug up and made into medicines under the direction of a Sage.' Step by step, the author describes these books, century by century, and also has an interesting chapter on foreign Herbals. We should like to quote much of the quaint information selected from these Herbals by the author, but possibly the extracts below will whet the appetites of our readers and persuade them to delve into the volume for themselves.

HERB IMPIOUS.

'When the flower hath long flourished and is waxen old, then comes there in the midst of the floure a certain brown yellow thrumme, such as is in the midst of the daisie, which floure being gathered when it is young may be kept in such manner (I meane in such freshnesse and well-liking) by the space of a whole year after in your chest or elsewhere; wherefore our English women have called it "Live-long," or "Live-for-ever," which name doth aptly answer his effects.' Another variety of cudweed was called 'Herbe impious' or 'wicked cudweed,' a variety 'like unto the small cudweed, but much larger for for the most part those floures which appeare first are the lowest and basest and they are overtopt by other floures, which come on younger branches, and grow higher as children seeking to overgrow or overtop their parents (as many wicked children do), for which cause it hath been called "Herbe impious."'

BIRD'S-EYE AND MARIGOLD.

Of the Herb commonly known as bird's-eye he tells us: 'In the middle of every small floure appeareth a little yellow spot, resembling the eye of a bird, which hath moved the people of the north parts (where it aboundeth) to call it Bird's eyne.' 'The fruitful or much bearing marigold,' he writes, 'is likewise called Jackanapes-on-horsebacke: it hath leaves, stalkes and roots like the common sort of marigold, differing in the shape of his floures; for this plant doth bring forth at the top of the stalke one floure like the other marigolds, from which start forth sundry other smal floures, yellow likewise and of the same fashion as the first, which if I be not deceived commeth to pass per accidens, or by chance, as Nature often times liketh to play with other floures; or as children are borne with two thumbes on one hand or such like,

which living to be men do get children like unto others : even so is the seed of the marigold, which if it be sown it brings forth not one floure in a thousand like the plant from whence it was taken.'

GOAT'S BEARD.

Goat's-beard still retains its old name of 'go-to-bed-at noon,' 'for it shutteth itselfe at twelve of the clocke, and sheweth not his face open untill the next dayes sun doth make it flower anew, whereupon it was called go-to-bed-at-noon : when these floures be come to their full maturitie and ripenesse they grow into a downy Blow-ball like those of the dandelion, which is carried away with the winde.' Of the wild scabious (still called devil's bit by country folk) he tells us : 'it is called Devil's bit of the root (as it seemeth) that is bitten off. Old fantasticke charmers report that the Devil did bite it for envie because it is an herbe that hath so many good vertues and is so beneficent to mankind.'

YORKSHIRE AMMONITES.

As an indication of the fact that there is still much to be done even upon such a subject as the Ammonites of the Yorkshire Lias, we give the following extract from a paper on 'The Correlation of the *Ibex* and *Jamesoni* Zones of the Lower Lias,' by Dr. L. F. Spath, which appears in *The Geological Magazine* for January.

CORRELATION OF THE IBEX AND JAMESONI ZONES.

'From a comparison of the Yorkshire succession with the sequences in Pabay and on the Dorset coast it would appear that the ammonite zones of Robin Hood's Bay were misidentified, for if the "extreme top of *valdani*" already contains *Platypleuroceras* of the *brevispina* group, it must be pre-*jamesoni* in date. But immediately above is supposed to follow the "*striatum* zone," and Mr. Buckman has stated that perhaps the lower part of this "*striatum* zone" was contemporaneous with the *lataecosta* subzone of Dorset. There would accordingly be no room for the *ibex* (= "*valdani*") and the true *jamesoni* beds. As yet, *Tragophylloceras ibex*, *Acanthopleuroceras valdani*, and the true *Uptonia jamesoni* have not been found in Yorkshire. A specimen labelled *A. ibex* by Professor Blake is a *Tragophylloceras* of the *numismalis* group (*T. typicum*, S.B.), belonging to the lower *jamesoni* zone, and Blake's examples of "*Aegoceras grenouillauxi*" (d'Orb.) are not *Coeloceras* of the *pettos* subzone, but young *Apoderoceras* of the base of the Carixian.'

SIMPSON'S TYPES.

'Also Simpson's *A. ripleyi*, *ignotus*, and *obsoletus* are

earlier than *Uptonia jamesoni*; but Mr. Buckman has recorded *Tropidoceras antiquum* (Wright) and *T. rotundum* (Futterer) from Robin Hood's Bay, and in Pabay the latter occurs just above the *masseanus* beds. [“*Harpoceras antiquum* Wright, originally stated to have come from the *jamesoni* zone, appears to be an Upper Lias Harpoceratid of the type of *Elegantuliceras ovatum* (Simpson).” *Beaniceras*, however, of the *centaurus* horizon or upper *ibex* zone in Oppel's meaning, also occurs in Yorkshire, together with its contemporary *Liparoceras*. Mr. Buckman's “*striatum* zone” would thus have to include not only part of Oppel's *davoei* zone (for Professor Watson found *Androgynoceras maculatum* 8 feet below the “Sandy Series” at Staithes) but one or two horizons of the *ibex* and upper *jamesoni* zones below. These Yorkshire beds are unfortunately poor in Ammonites and difficult to collect from, and will require further careful investigation. So far, the succession also confirms that of Pabay.’ We hope this is quite clear.

MAN AND THE GLACIAL PERIOD.

At a recent meeting of the Geological Society of London, Prof. Sollas delivered a lecture on Man and the Ice-Age. He said that, thanks to the researches of General de Lamothe, Prof. Depéret, and Dr. Gignoux, the Quarternary System now takes its place as a marine formation in the stratified series. Four ancient coast-lines of remarkably constant height have been traced around the Mediterranean Sea and along the western shores of the North Atlantic Ocean. These, with their associated sedimentary deposits, form the successive stages of the Quaternary System: namely, the Sicilian (coast-line about 100 metres); the Milazzian (coast-line about 60 m.); the Tyrrhenian (coast-line about 30 m.); and the Monastirian (coast-line about 20 m.). The Sicilian deposits rest unconformably upon the Calabrian (Upper Pliocene), and in their lower layers contain a characteristic cold fauna. The fauna of the Milazzian is warm-temperate, of the Tyrrhenian and Monastirian still warmer, for they contain numerous species of mollusca which now live off the coast of Senegal and the Canary Islands. The three lower coast-lines correspond with the three lower river-terraces of the Isser (Algeria), the Rhône, and the Somme. Hence it may be inferred that the position of the river-terraces has been determined by the height of the sea-level.

CONTENTS OF GRAVEL TERRACES.

The lower gravels of the three lower terraces of the Somme all contain a warm fauna, *Elephas antiquus* and *Hippopotamus*, and thus (like the corresponding marine sediments) testify to a warm climate. The climate of the Quaternary age was,

on the whole, warm-temperate or genial, but interrupted by comparatively short glacial intervals. It is now possible to assign the Palæolithic stages of human industry to their place in the Quaternary System: thus the 'Strepyan' or pre-Chellean is Milazzian in age, the typical Chellean—Tyrrhenian, the evolved Chellean, Acheulean, and Lower Mousterian—early Monastirian, and the Upper Mousterian, Aurignacian, Solutarian, and Magdalenian—later Monastirian. The coast-lines of the Northern Hemisphere appear to have their counterparts in the Southern Hemisphere, and the researches of Dr. T. O. Bosowrth in Peru, and Prof. G. A. F. Molengraff in the East Indies, have revealed extensive marine Quaternary deposits and successive movements of the sea-level. The Quaternary movements are probably due to a general deformation of the globe involving eustatic changes in the level of the sea.

MALHAMDALE.

We must say our sympathies go to the inhabitants of Malhamdale in their efforts to prevent the erection of a small-pox hospital at Airton. Doubtless such a hospital is needed somewhere, and the further away from thickly-populated centres the better; but, from the point of view of the hospital, the site has disadvantages, and one of the most charming of our fine Yorkshire dales would lose its attractiveness. A strong protest is being made locally, and the *Skipton Pioneer* for January 12th contains good reasons for the abandonment of this site.

MR. J. F. MUSHAM.

Selby Naturalists have certainly suffered a loss now that their Hon. Secretary, Mr. J. F. Musham, has left the district. At the recent annual meeting, the opportunity was taken of shewing the society's appreciation of his services by the presentation of what is described as a 'purse of gold' (though we suspect the none-the-less welcome treasury notes!), and Mr. Musham was elected an honorary life-member—an honour held previously by the present writer only.

AND THE SELBY SCIENTIFIC SOCIETY.

In making the presentation, Mr. W. N. Cheesman, J.P., a founder of the Selby Scientific Society, stated he remembered the time when Mr. Musham and himself and a few friends assembled to form the Selby Scientific Society. Little did they think what the Society would become in the course of a few years. They had a small beginning, but from the first it went with a flush, and showed a numerical strength in its infancy, which was due to the able way in which Mr. Musham engineered its progress. A president was all very well, but

the secretary was the one who managed the concern, and if a society had an inefficient secretary it was doomed to failure. They were able to understand why the Society had flourished. It had justified its existence among the Scientific Societies of the county. In contact with members of other societies he was frequently asked, 'What is the secret of success in this Selby Scientific Society of yours which we hear so much about?' His reply had been, 'We have a secretary.' He believed he was correct in saying that it was the largest Society, in proportion to the population of the town, in the county. They could not too warmly express their thanks to Mr. Musham for what he had done for them.

PRE-GLACIAL MAN AGAIN.

We take the following from a report which has been pretty well distributed in the press:—'Mr. J. E. Sainty, a master of the City of Norwich School, showed an exhibit at a meeting of the Prehistoric Society of East Anglia at Norwich recently, which aroused overwhelming interest. He described it as a hand-axe of the Chelles type, found by him in the contorted drift of the cliffs at Overstrand. It was a finely chipped specimen, quite typical, with a slight purplish patina, and is perhaps the first definite evidence that Chelles man was pre-glacial, and probably contemporary with the Cromer Forest bed. As evidence of human life going back beyond the glacial period in this country, the discovery of this implement is one of the most interesting of the many contributions which have recently been made by Norfolk Research to pre-historic knowledge.'

DOUBTS.

'Before we feel inclined to accept this object of overwhelming interest' as authentic, we should like to know what evidence there is that the implement actually is contemporary with the Contorted Drift. There are so many ways in which later objects can be incorporated in Boulder Clay, as our East Anglian friends have already proved in their alleged Pre-historic human skeleton, which, after having been described as Pre-glacial in the scientific and general press, was admitted to be of modern date. We remember some years ago quite a stir being made by the announcement that an unquestionable humanly worked axe-head had been found in North-east Yorkshire, and in a well known volume on Relics of the Old Stone Age, it is illustrated and described as *one of the best examples of its kind*. Fortunately we had the pleasure of seeing it, and it was nothing more nor less than an ordinary lenticular nodule from the Yorkshire Lias, which had never been touched by human hands until picked up from the Boulder Clay by its 'discoverer.'

YORKSHIRE GREAT BUSTARDS.

T. SHEPPARD, M.SC.

THE photograph reproduced herewith represents a fine pair of Yorkshire Great Bustards now in the Municipal Museum, Hull. They are referred to in Nelson's 'Birds of Yorkshire' as having been killed near Malton in 1825, and were then in the Blackmore Museum, Salisbury, to the authorities of which we are indebted for kindly allowing them to come to Hull.

The specimens have been re-set recently, but attached to the case is the following label, from the nature of the lettering, etc., of which it is obviously the original label put on by the Blackmore Museum, and we should imagine is contemporary with the original case:—'Pair, ♂ and ♀, Great Bustards (*Otis tarda*), killed at Malton, Yorkshire, 1825. From the collection of the late Mr. Milton, Great Marlborough Street, London, and deposited in the Salisbury Museum by Mr. Henry Blackmore.'

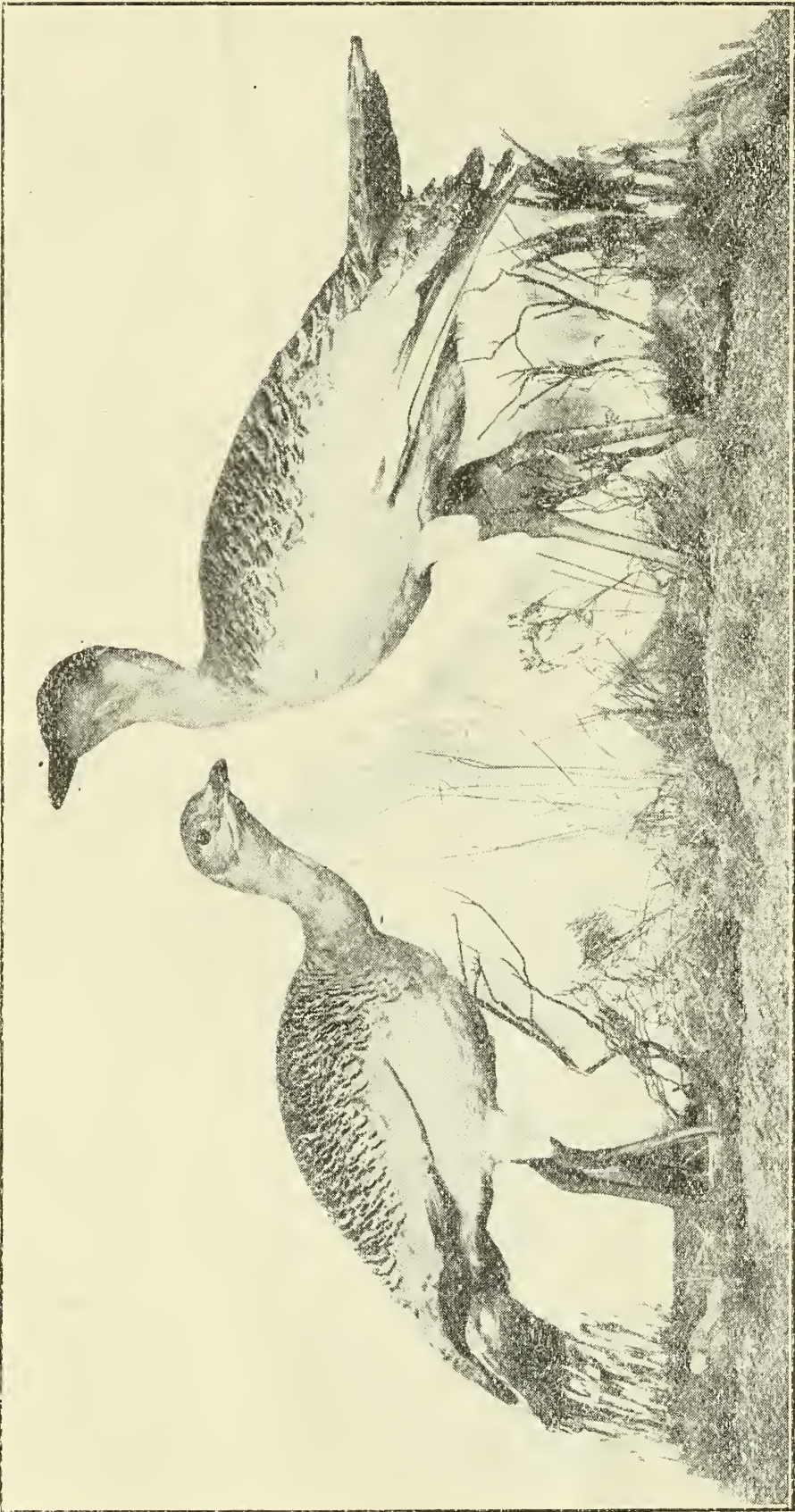
The particular specimens are described by Thomas Norwood of Salisbury, in *Country*, Vol. VIII., 11th January, 1877, page 39.

I had difficulty in tracing this old journal, and eventually Mr. R. F. Sharp, Deputy Keeper of the Department of Printed Books, British Museum, was good enough to supply me with the following copy of the entry referred to:—

'The Bustards in the Blackmore Museum are those of the Great Bustard. They are four birds, two males and two females. One pair killed at Malton, Yorkshire, in 1825. The height of the male is a little under 3 ft., the tuft of feathers on each side of the lower bill about 6 ins. in length; the height of the female about 26 ins. Of the other pair, the male was shot at Berwick St. James, Wilts., 26th January, 1871. The height of this bird is 3 ft., the tuft of feathers on the lower bill is about 2 ins. in length. From this I should suppose it was a young bird. Another was in company with this one when shot, and, from the description given me at the time, I have no doubt that it was a male bird. The female was shot at Maddington, Wilts., 23rd January, 1871, by a boy employed in keeping rooks off the wheat. He approached the bird within seventy or eighty yards, and, having the gun loaded with a marble, so shot it. All these birds are in excellent plumage and condition.—THOS. NORWOOD Salisbury.'

As is well described in the 'Birds of Yorkshire,' this species, once fairly common on the extensive downs and plains of England, was practically exterminated about the

year 1840, the last fertile eggs being taken in Norfolk in 1838,



Yorkshire Great Bustards.

and the last survivor of the Yorkshire Wolds was trapped in 1832.

During the war, the late Bulmer Rudd, of Ripon, advised me of a sale in his town of the contents of a large and well-known collection, and among the specimens was an exceptionally large male Great Bustard, a Yorkshire shot specimen. Through his good offices it was purchased, and is now on exhibition with the specimens already described.

Another example in the Hull Museum, which originally came from the Pease Collection, is a female which was killed at Poynings Common, Pevensy, Sussex, in 1837.

The late Thomas Boynton, of Bridlington, had a couple of birds, one from the Scarborough collection, and another, which was picked up near Bridlington Bay just dead, but still warm, in 1864 (see *Zoologist*, 1865, page 9442). These two examples are now in the possession of a well-known Yorkshire collector.

Of the five specimens in the Museum of the Yorkshire Philosophical Society, at York, one, a female, is from 'Rufforth, Yorks., Feb., 1861, purchased.' It was shot there, and is one of the few occasional visitors to this country since the race became extinct here. Two of the others are 'locality unknown,' another is non-British. The others are ♂s. One is certainly non-British, Dr. Collinge informs me. Mr. St. Quintin, who recently presented two of them to the museum at York, states that the ♀ is from East Prussia, and that the ♂ was shot by John Cooper, of East Ayton, near Scarborough. He used to 'sport' on the Flixton and Staxton Wolds, east of Ganton. Mr. St. Quintin bought the bird from Mr. Cooper's son, and considers it is one of the old resident British stock, and would be killed before 1832.

Formerly there were some Yorkshire Bustards at Thorpe Hall, but they became 'mothy,' and were burnt!

There is a pair of Great Bustards in the Scarborough Museum, purchased from Hugh Reid, of Doncaster, and presented in 1839. These may be Yorkshire shot birds, but there appears to be no record.

Also at Scarborough is a fine male, formerly the property of the Tindall family, of Knapton, and is quite possibly a Yorkshire bird, but information on the point is wanting.

The Scarborough Museum also possesses the only Yorkshire Bustard egg known to exist. It was taken at North Dalton in 1810, and was *boiled* in order to preserve it! I hear it is still at Scarborough, but in bad condition, and has lost all its colour.

In the Beverley Museum is a young female Great Bustard, formerly in the Scarborough Collection (see 'Birds of Yorkshire,' page 556).

The specimens in the Sheffield Museum are from the Danube, I am informed.

We should be glad to hear of any other Yorkshire specimens.

FIELD NOTES.

MAMMALS.

Otters at York.—Otters are seldom seen in broad daylight, especially in populous places. On January 26th, as my train, due at York at 10-15 a.m., crossed the Ouse, I saw two Otters in the river below, about thirty yards on the down stream side of the bridge, and about the same distance from the right bank. They were rolling over each other, as one used to see the tame Otters, when at play, in the old Otter pond in the London Zoological Gardens. I have since learnt that these Otters were seen by another passenger in the same train, who reported it to his friends on reaching York. Needless to say there was nobody to be seen at the time on the public walk close by. The Otters evidently felt quite at home, and paid no attention to the trains. It is to be hoped that they will not be molested.—W. H. ST. QUINTIN.

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FISHES.

Great Weever near Scarborough.—On January 20th, 1923, Mr. F. Grant sent to me an unknown fish which had been landed on that day by one of our local trawlers. It proved to be a practically full-grown example of the Great Weever (*Trachinus draco*), measuring $11\frac{1}{4}$ inches in length, which is about an inch less than the usual adult size. This fish appears to be of rare occurrence off the Yorkshire coast, for this is only the second I have seen landed here during many years' observation. It occurs occasionally at Whitby, and there are a couple of locally taken specimens preserved in the Museum there. A closely allied species—the Lesser Weever—is common in the inshore Yorkshire waters, and both it and its larger relative have the power of inflicting extremely poisonous wounds with the sharp spines in their dorsal fins and gill covers.—W. J. CLARKE.

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INSECTS.

Some Scarborough Insect Notes.—In August of last year a single specimen of *Colias croceus* Fourc. (*edusa* F.) was seen on the moors above Robin Hood's Bay. The Convolvulus Hawk-moth (*Sphinx convolvuli* L.) seems to have been common this year; I have had half-a-dozen specimens brought to me, one of which, from Driffield, laid eggs, unfortunately sterile. One Death's Head (*Acherontia atropos* L.) was brought to me from the entrance to a beehive. A single example of *Boreus hyemalis* L. was seen in the snow last winter on Oliver's Mount, and the macroforcipital form of the common earwig (*Forficula auricularia* L.) on a patch of

moorland up Harwood Dale. The Bristle-tail *Thermobia furnorum* Rovelli, was found in a bakehouse in Scarborough, running about in places where it was too hot to bear the hand ; and the ' Silver-fish ' (*Lepisma saccharina* L.) occurred in a cupboard. A specimen of the ' Solitary " Ant " ' (*Mutilla europaea* L.) occurred on September 9th on the slopes of a tumulus just north of the ' Falcon Inn.'—GEO. B. WALSH, B.Sc., Scarborough.

Pulvinaria vitis Linn. on Privet.—In the autumn of 1921 my attention was called to a privet hedge at Huddersfield, attacked by a scale insect, of which only a few remains existed at the time. The scales reappeared last year also, but only sparingly—the greater part of the hedge being dead—a condition due, no doubt, to the presence of these insects. Prof. Newstead has kindly determined the species, and remarks that privet is ' a very unusual food-plant ' for *Pulvinaria vitis*.—CHARLES MOSLEY, HUDDERSFIELD.

Chrysopa septempunctata Wesm. in Yorkshire.—Some time ago Mr. H. Maxwell Stuart sent me some neuroptera, among which was a specimen of *Chrysopa septempunctata*, taken by himself at Everingham last July, but it was not until some time afterwards, on casually looking through the list of Yorkshire Neuroptera, that I realized the fact that the species was unrecorded for Yorkshire. It is an abundant insect in many parts of England, and one would have expected it to have been turned up in our large county long ago.—Geo. T. PORRITT, Elm Lea, Dalton, Huddersfield, February 7th, 1923.

Doryphora (Gelechia) lucidella in Yorkshire.—This tineid was plentiful but very local in the boggy ground near Pilmoor on July 5th, 1922. The only record in the Yorkshire list appears to be, ' York (Stainton's Manual).' *Bryotropha senectella*—took a specimen of this *Gelechia* in the garden at Linthorpe, Middlesbrough, on July, 1920, previously recorded for Redcar and Scarborough. *Lita tricolorella*—took specimens of this quite fresh off a water trough near Great Ayton in August. *Argyresthia atmoriella*—noticed in the pine plantations near Middleham on the occasion of the Yorkshire Naturalists' Botanical Section's visit in June last. *Oecophora stipella* and *Stigmonota coniferana* were also seen on the same visit among the firs.—T. ASHTON LOFTHOUSE, Linthorpe, Middlesbrough.

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FUNGI.

Pterula multifida in Yorks.—A fine bunch of *Pterula multifida* Fr. (Clavariaceae) was brought for identification by Mr. A. Lees, from Honley, during the last week in January.

The fungus was found in a dyehouse at Honley, growing from the crevices of the woodwork on the underside of a four-wheeled coach in ordinary use for carrying wet dyed wool. It has not been previously recorded for Yorkshire. The habitat is remarkable, it being described in the text-books as occurring on dead leaves and branches. It is on exhibition in the Botany Room, Tolson Memorial Museum, at Huddersfield.—A. CLARKE, Huddersfield.

Stereum Karstenii Bres.—This fungus was first found in Britain at the Yorkshire Naturalists' Union Fungus Foray at Buckden, October, 1922 (see *The Naturalist*, January, 1923, p. 11). Miss E. M. Wakefield, of the Herbarium, Kew, who specializes in resupinate fungi, kindly named the specimens, and has now furnished the following description :— 'Resupinate, at first in small, thick, cushion-like patches, later becoming confluent, fleshy but tough, slightly separable ; Hymenium alutaceous to pinkish-buff, cracked when dry, and showing the whitish, silky subiculum in the interstices. Margin white, fimbriate. Cystidia present, smooth, hyaline, thick-walled, very long, projecting up to about $25\ \mu$, $4\text{--}5\text{--}6\ \mu$. wide above. Basidia crowded, $2\text{--}3$ (-4) μ . wide, with $2\text{--}4$ sterigmata. Spores allantoid, hyaline, $5\text{--}6 \times 1\text{--}1.5\ \mu$. Distinguished from other British species of *Stereum* by the comparatively soft texture, spores and cystidia.'—A. E. PECK.

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Side Lights on Birds, by H. Knight Horsfield, M.B.O.U. London : Heath Cranton, Ltd., 224 pp., with good index, price 12/6. The author has produced a delightful book upon somewhat unusual lines. In a pleasant and original manner he presents a mass of information, summarising and bringing the most recently acquired ornithological facts before the student and general reader. To the beginner in the study of birds the book is especially valuable. It is divided into two parts, the first of which, in its sixteen chapters, deals with almost every aspect of bird life from the Structure, Migration, Language to Marriage, etc., with additional chapters devoted to the consideration of the Artist, the Poet and the Bible in their connection with bird life. To the field naturalist, Part 2 is particularly interesting, giving the author's field experiences of birds in Shetland, the Outer Hebrides, Norway, Canada and a Swiss Glacier. There is an exception to almost every rule in bird life ; the author states that the Sandwich Tern never builds a nest ; the great majority certainly do not, but the writer has several photographs of real nests of the Sandwich Tern, one of which, with three eggs, is of considerable size. The author, as is well known, is the Natural History Editor of the *Yorkshire Weekly Post*, and acknowledges useful information received through that agency, often from 'unexpected quarters.' Strange information comes to hand at times, but no one is better qualified than Mr. Horsfield to sift and ascertain the true value of such material. There are some charming photographic illustrations, but, unfortunately, the coloured frontispiece of the Labrador Falcon is not a success. A former Secretary and President of the Yorkshire Naturalists' Union, Dr. W. Eagle Clarke, commends the book (of 'my oldest bird friend') to the reader. Which commendation the writer endorses.—R.F.

COLEOPTERA IN YORKSHIRE IN 1922.

W. J. FORDHAM, M.R.C.S., L.R.C.S., D.P.H., F.E.S.

THE following list of the noteworthy species captured in the county during the somewhat unproductive season of 1922, together with a few unrecorded insects taken in previous years, includes six native and one introduced species which are new to our list, and also four new well-marked varieties, two of which latter were previously given specific rank. Twenty-five species have been recorded as new to various vice-counties, of which number V.C. 64 claims fourteen.

ABBREVIATIONS, ETC.

† = New to County.	* = New to Vice-County.
E.G.B. = E. G. Bayford.	T.B.K. = T. B. Kitchen.
J.M.B. = J. M. Brown.	T.S. = T. Stainforth.
W.J.F. = W. J. Fordham.	M.L.T. = M. L. Thompson.
A.E.W. = A. E. Winter.	G.B.W. = G. B. Walsh.

†*Nebria ibirica* Oliv. Was introduced to the British List by Donisthorpe (*E.M.M.*, 1922, lviii., p. 92). It differs from the common *brevicollis* F. in the glabrous upper surface of the posterior tarsi (which are pubescent in *brevicollis*) and the striæ of the elytra are not so deep. The genitalia of the two forms are different, and Col. Deville considers that the two insects are distinct. Mr. G. B. Walsh says that most of his local (*e.g.*, Seamer Moor, 'The Falcon' and Yedmandale) specimens belong to this form.

Bembidium doris Pz. Chandler's Whin, June, M.L.T. (*64) (see *The Naturalist*, 1922, p. 328 for list of insects taken on the occasion of the visit of the Entomological Section Yorkshire Naturalists' Union, of which the following are also new to V.C. 64: *Agonum piceum* L., *Lathrobium quadratum* Pk. and *Stenus latifrons* Er.).

Badister unipustulatus Bon. This is not given in the Victoria County History as occurring in Yorkshire. A record in Stephens' 'Systematic Catalogue of British Insects,' 1829 (p. xviii. of the Introduction) of its capture near Hull in 1807 by Mr. Haworth, under its old name *Badister cephalotes*, was credited by W. D. Roebuck in his MSS. notes to *Brosicus cephalotes*, and as such was included by W. C. Hey in his 'List' (*Trans. Y.N.U.*, 1885, p. 30). There is a recent record for the species in Fowler's Supplementary Volume, p. 203, Eastoft (Crawshay). So the insect is still in existence in the East Riding, and this is apparently its most northerly station. There are also old records from Lincolnshire.

Amara lunicollis Schiodt. Allerthorpe Common, at heather roots, 19-6-21. One dark bronze example and three entirely black (*61).

Pterostichus minor Gyll. Harewood, 12-19, T.B.K. (*64).

Cymindis vaporariorum L. Moors near Robin Hood's Bay, August, T.S.

Coelambus impressopunctatus Schal. Hull district, in brackish water, October, G.B.W. (*61), together with *C. parallelogrammus* Ahr.

[*Hydroporus halensis* F. must be deleted from the Yorkshire list for the present as the specimens from Welwick, on which it was introduced by Mr. Walsh (Yorks. Col. Report, 1919), have proved to be *C. parallelogrammus*. There is no reason why *halensis* should not occur with us. It has occurred in Essex, Suffolk, Norfolk, Cambridge, Lincolnshire, N., Nottinghamshire, Lancashire, S., and Cumberland, and there is a Scotch record from Dumfries, and a

very doubtful one from Mull. The Cumberland record is an old one, but the Lincolnshire example was taken by Dr. Wallace at Ulceby in 1906, and the Nottinghamshire specimen by Rev. A. Thornley at South Leverton in 1895].

Hydroporus striola Gyll. Moors above 'Falcon' Inn. Uncommon, G.B.W., together with *H. melanocephalus* Gyll. (*morio* Brit. Cat.) abundant, and several *Hydropori* and *Rhantus bistriatus* Berg.

Helophorus æqualis Th. Swillington, T.B.K. (*64).

H. granularis L. var. *†ytenensis* Shp. Bubwith, flood refuse, November 18, W.J.F., a specimen which Commander J. J. Walker thinks is this variety. Mr. Day has taken it in Cumberland. The type has been previously recorded from Bubwith (Y.C.C., 1916).

†*Limnebius papposus* Muls. Escrick, East Yorks, August, 1915, W.J.F. This insect is rather common and widely distributed from the Midlands towards the south, but has apparently not been previously recorded north of Lincolnshire.

Microglossa pulla Gyll. Thornton Dale, G.B.W.

†*Myllæna dubia* Gr. Chandler's Whin, M.L.T. (*The Naturalist*, 1922, p. 328). This beetle is apparently widely distributed in the British Isles, but not common.

Mycetoporus brunneus Marsh. Stonymarl Moor. Under algæ, G.B.W. *Quedius othiniensis* Johan. Battersby, bred from larva taken in a mole's nest, M.L.T.

Q. maurus Sahl (*fageti* Th.). Harrogate, in fungi, A.E.W. (*64).

Philonthus rotundicollis Mén. (*scutatus* Er.). Harwood Dale, one under stone, G.B.W. A rare northern species, so far only taken in V.C. 62, which is apparently its most southerly area.

Lathrobium terminatum Gr., var. *†immaculatum* Fow. Chandler's Whin, M.L.T. (*The Naturalist*, 1922, p. 328). We have now records for all three forms of the species for the county. The type possesses a yellow spot at the apex of each elytron, absent in the vars. *immaculatum* Fow. and *atripalpe* Scriba. The former name should be reserved for the Southern and Midland form with clear testaceous legs, and the latter for the Northern, Welsh and Irish form with darker legs (see W. E. Sharp, *Ent. Rec.*, XXIV., p. 260).

Coprophilus striatulus F. Harrogate, April, A.E.W. (*64) and in some numbers in a hotbed at Marton, Cleveland, in early May, W.J.F.

Lesteva longelytrata Goeze, var. *†maura* Er. Not uncommon on the banks of Scalby Beck. The only record for this variety given by Fowler (*Brit. Col.*, VI., 338) is Isle of Eigg (Donisthorpe).

†*Choleva oblonga* Lat. (*intermedia* Kr.). Aughton near Bubwith, in mole's nest, April, 1917, W.J.F.; Great Ayton, under stone, January, 1908, W.J.F. These two specimens have been identified by Mr. Walker as probably *intermedia*. The species frequents mole's nests and rabbit burrows, and has been taken in Cumberland.

Catops fumatus Spence. Raincliffe Woods, G.B.W.

Cateretes pedicularius L. Forge Valley, G.B.W.

Soronia grisea L. Bilton Woods, August, A.E.W. (*64); Ecclesall Wood, Sheffield, J.M.B.

Epuræa fuscicollis Steph. (*diffusa* Bris.). Harewood, 1921, T.B.K. (*64). A rare species with but few British records.

Meligethes rufipes Gyll. Bridlington, J.M.B. (*61), Ecclesall Wood, J.M.B.

Glischrochilus (Ips) olivieri Bed. Thorner, T.B.K. (*64).

Rhizophagus depressus F. Blackmoor, near Leeds, T.B.K. (*64).

Monotoma longicollis Gyll. Thornton Dale, G.B.W.

Silvanus surinamensis L. Extremely abundant in scullery of house in Hull in June. The wall has matchboard covering damp plaster, and the insects come out from this, especially on warm days. They disappeared with the advent of colder weather.

- Cryptophagus pubescens* Stm. Scarborough, G.B.W., previously taken here many years ago by R. Lawson.
- C. pallidus* Stm. Seamer Moor, G.B.W. (*62).
- Aphodius pusillus* Hbst. Whernside, sheep dung, May 21, W.J.F. (*65).
- Selatosomus æneus* L. Harrogate, May, A.E.W.
- †*Elatér nigrinus* Pk. Hayburn Wyke, by beating, June, G.B.W. Several specimens seen, but only one taken as mistaken in beating tray for a commoner species. This is a rare species, mainly taken in Scotland, but recorded from a few localities in South England.
- Limónius æruginosus* Ol. Allertorpe Common, W.J.F.
- Microcara bohemani* Man. Ellerburn Moss in waterfall, G.B.W. (*62).
- Cantharis paludosa* Fall. Askham Bog, June, J.M.B.
- †*Lyctus linearis* Goeze. Barnsley, introduced, E.G.B. Specimens emerging from a drawer in a small cabinet ; the original source of wood not known. There is no reason from the known distribution of this beetle why it should not occur naturally in Yorkshire.
- Ptinus tectus* Boield. Sheffield in house, J.M.B. This species is evidently spreading in the county, as elsewhere in the Kingdom.
- Ptilinus pectinicornis* L. Bilton Woods, August, A.E.W.
- Stenochorus meridianus* L. Ecclesall Wood, on *Heracleum*, J.M.B., Bramham, T.B.K.
- Clytus arietis* L. Askern in fair numbers basking in the sun, June, A.E.W.
- Tetrops praeusta* L. Askham Bog, June, T.B.K. It is pleasing to note that this local species is still in existence in this locality. The only other station in the county is Wheatley Wood.
- †*Lema puncticollis* Curt. Pickering, common on thistles in Newton Dale, Sept., G.B.W. This insect is more common in the south.
- Chrysomela brunsvicensis* Gr. (*didymata* Brit. Cat.). Pickering, Sept., G.B.W., together with *C. hyperici* Forst. and *C. varians* Schal., the latter species being extremely abundant.
- Phytodecta pallida* L. Bishoptdale, August, C. A. Cheetham.
- Halitica oleracea* L. Pickering, also a form rounder and bluer than type, G.B.W.
- Phyllotreta exclamationis* Thumb. Ecclesall Wood, J.M.B.
- Anthribus variegatus* Fourc. Forge Valley, one by sweeping, G.B.W. (*62).
- Barypithes araneiformis* Schr. Scalby, cut grass, G.B.W.
- Bagous tempestivus* Hbst. North Duffield Ings, April, 1912. A very small example named by Mr. J. J. Walker, W.J.F.
- Rhinoncus perpendicularis* Reich. Scarborough Mere, G.B.W.
- R. gramineus* F. Leathley, near Leeds, T.B.K. (*64).
- Ceuthorrhynchus quadridens* Pz. Hayburn Wyke and Ellerburn, G.B.W.
- Anthonomus inversus* Bed. v. †*rosinæ* Goeze. Forge Valley, one by beating, G.B.W. The type form has been taken at Lewisham, and in Kilton Woods.
- Magdalis carbonaria* L. Aberford, T.B.K. (*64).
- Erythrapion desideratum* Sharp. Bubwith, W.J.F. (*61). Several specimens which Mr. Walker thinks are this species.
- E. brachypterum* Shp. Flixton, G.B.W. (*61).
- Apion punctigerum* Pk. Scalby, cut grass, G.B.W. (*62).
- Rhynchites harwoodi* Joy. Martin Beck Wood, June, 1920, W.J.F. (*63).
- R. pubescens* F. Bilton Woods, one on hazel, July, A.E.W. Only previous Yorkshire record is Studley (E. A. Waterhouse).
- Notoxus monoceros* L. Flixton Sandpit, in Aug., a black example, W.J.F.
- Orchesia micans* Pz. Harrogate, bred from fungi taken in October, 1921. The beetles emerged June 18th onward, A.E.W.
- Melandrya caraboides* L. Askern, a very small specimen in an old willow, June, A.E.W.
- Crypticus quisquilius* L. Flixton Sandpit, one at plant roots, W.J.F.

NORTHERN NEWS.

Among the small list of names of donors to a northern Museum we notice those of 'Pitchforth' and 'Stockwell.'

Professor G. H. Carpenter, formerly of the Dublin Museum, has been appointed Keeper of the Manchester Museum in place of Dr. W. M. Tattersall.

We notice from the Annual Report of an important Museum recently received that 'Educational work has been a prominent feature of the year's activities.' Personally, we should have been surprised to have heard otherwise.

A scheme is afoot for a Memorial to the late Benjamin Harrison, of Ightham, Kent, well known for his work among the Eoliths. It is stated that a tombstone has been erected in his memory bearing a carved Eolith at its head.

Among many interesting papers, *The Journal of the Ministry of Agriculture* for November has notes on 'A New Apple Pest [*Anthonomus cinctus*, Kollar=*A. pyre* Boh.],' by J. C. F. Fryer, and 'A Local Investigation of the Food of the Little Owl,' by Dr. W. E. Collinge.

The Leeds Conchological Club has issued an attractive syllabus for 1923. Mr. J. W. Taylor, M.Sc., is the Hon. Life President; the President is Mr. T. Pickersgill; the Hon. Treasurer, Mr. J. F. Musham; and the Hon. Secretary, Mr. F. Booth, 18 Queen's Road, Shipley.

We have been favoured with a reprint of a description of a rare form of Bronze-Age Cup, with handle, which has been damaged and repaired before baking; but how it can be described as 'an old time Christmas Tragedy,' seeing that it was made long before Christ was on this earth, is a little difficult to understand.

The well-known Lloyd Library, in Cincinnati, Ohio, has now commenced publishing an Entomological series of monographs, the first two being devoted to 'The Biology of North American Caddis Fly Larvæ,' by J. T. Lloyd; and 'Notes on the Biology of some of our North American Species of May-flies,' by Helen E. Murphy, respectively.

Bulletin No. 8 of the Bureau of Bio-Technology completes the first volume of this interesting publication. Besides the following valuable contributions to science, from an economic point of view, there are numerous useful illustrations throughout the text: 'The Prevention of Ropiness in Beer'; 'The Suppression of Insect Pests and Fungoid Diseases'; 'Acidity of Tan Liquors'; 'Spray Spreading Agents'; 'Potato Trials,' and 'The Greenhouse Grasshopper.' The contributors are F. A. Mæsen, T. Parker, P. Hampshire and A. W. Long. Messrs. Murphy & Son have produced the *Bulletin* in a worthy fashion.

According to the press the unusual sight of a fight between a stoat and a 'crow' has been witnessed at Harlaxton's Manor, in South Lincolnshire. The stoat had seized the 'crow' by the breast, while the latter was endeavouring to beat off the stoat with its wings. Unable to do so, the bird succeeded in taking wing with its adversary hanging on in firm grip. The fight in the air was continued, and the bird's feathers were flying about in all directions. It made a low circular flight of the field before its strength failed, and then, coming down to the ground exhausted, was easily accounted for.

The Proceedings of the Geologists' Association, Vol. XXXIII., pt. 4, are edited by G. M. Davies, and contain, among other matter, 'The Liassic Rocks of Glamorgan,' by A. E. Trueman; 'Geology of the Country around Felixstowe and Ipswich,' by P. G. H. Boswell and I. S. Double; 'Perna Bed, and the Weald Clay at Reigate,' with Report of Excursion to Reigate; Notes on the Geology of the Langdon Hills, Essex, with Report of Excursion. Another part contains 'Some of the Early Work and Publications of the Geologists' Association, with a Note on the Geological and Natural History Repertory,' by E. T. Newton; 'Evolution: a Resultant,' by W. D. Lang; and 'Sub-soil Flint Flaking Sites at Grays,' by S. Hazzledine Warren.

BOTANICAL SURVEY AND ECOLOGY IN YORKSHIRE.

T. W. WOODHEAD, PH D., M.SC., F.L.S.

*Being the Presidential Address delivered at Scarborough,
December 9th, 1922.*

As a Yorkshireman, with a wholesome pride in my native county, allow me at the outset to express my earnest appreciation of the honour you have done me in electing me President of this Union of Yorkshire Naturalists. The excellent report which has been presented by our two enthusiastic Secretaries, shows that the Union, now in its 61st year, is still as vigorous as ever, and the work of its members ranks high in the realm of Natural History.

The visit of the British Association to Hull this year, was chosen as a fitting opportunity to lay before the members of this "parliament of science," some indication of the character and scope of the research now in progress by the numerous sections of the Union and its members (120)*. The effect of the exhibits on all who saw them was very gratifying.

Throughout its long history, it has been one of the chief aims of the Union to encourage the amateur in science, of whom Yorkshire has reason to be proud, as our county has supplied an unending stream of worthy devotees in every branch of natural history. The source of this stream is two-fold; firstly, from nature herself which has placed such a generous field for study at our doors, and secondly, a native population still primitive enough to feel at one with nature and sufficiently advanced to appreciate her beauties and advantages.

These workers who have done so much to make our county classical ground in so many directions, know no creeds nor titles, the one and only key to open our door is a love of nature for her own sake. A glance at our long list of presidents—and the same would apply to our officials and members—shows how truly democratic our Union is; they are drawn from every class and calling, Bankers and Butchers, Doctors and Drapers, Civil Servants and Chemists, Printers and Parsons, both church and dissent—including Bishops—Manufacturers and Merchants, Professors and Teachers, and even Museum Curators! not to mention Lords, Baronets and Knights, but they have all one common bond of Union, they have found in the county inspiration for their work, and this in turn has proved an inspiration and stimulus to others to take up and continue the pursuit of knowledge for the wholesome pleasure it brings, not only to themselves, but to those around them. That being so, it is no wonder that so many presidential

*The numbers in brackets refer to the items in the bibliography.

addresses have recorded, with obvious pleasure and profit, the work of those who have laid the foundations of knowledge on which we of the present day are building.

This reminiscent mood may be a sign of old age, or merely the result of experience, but none the less it is well we should take stock now and then, or we might find ourselves drifting to an unstable and adverse position.

Such thoughts as these have constantly recurred to me when considering the subject for the address this evening. As this is the year when something botanical is expected from your president, I turned back my thoughts some 40 years to the presidential addresses by one of Yorkshire's most noted botanists, John Gilbert Baker. His first address delivered at Selby on March 3rd, 1883, was on "The present state of our knowledge of the Geography of British plants" (7). In his second address to the Union at Barnsley in March, 1884, he spoke of the "Fathers of Yorkshire Botany" (8). I have always looked up to Baker as an ideal amateur botanist—keen, thorough, conscientious, kindly to a degree, and ever ready to place his great store of knowledge at the disposal of the beginner, in a quiet and unassuming way which made him a friend of everyone who knew him.

In the latter address, Baker spoke in a truly sympathetic spirit of the founders of our knowledge of Yorkshire botany, Johnson, Lister, Tofield, Salisbury, Fothergill, Teasdale, Lawson and others, names known to most of us to-day chiefly by the plants named in their honour. He urged us to emulate their diligence and good qualities, and for this reason alone it is well that at times we should recall the efforts of these pioneers in our science. Baker did that so well and so lovingly that there is no need to retrace his steps, but instead, take up the subject of more recent botany in Yorkshire and take stock of our present position. When Baker gave his presidential address, his "Flora of North Yorkshire" (5) was 20 years old, having been published in 1863. Yet it is only two short years since he left us to join the "Fathers" he strove so successfully to emulate. In 1866 he left Yorkshire to take up a life time's work at the Herbarium at Kew, where his output was as prodigious as it was profound.* Notwithstanding

*See "Naturalist" Jan., 1907, and Nov., 1920.

his great labours at Kew, his "North Yorkshire" will remain for all time a notable example of field work. Before this time, however, much work had been done which must claim our notice.

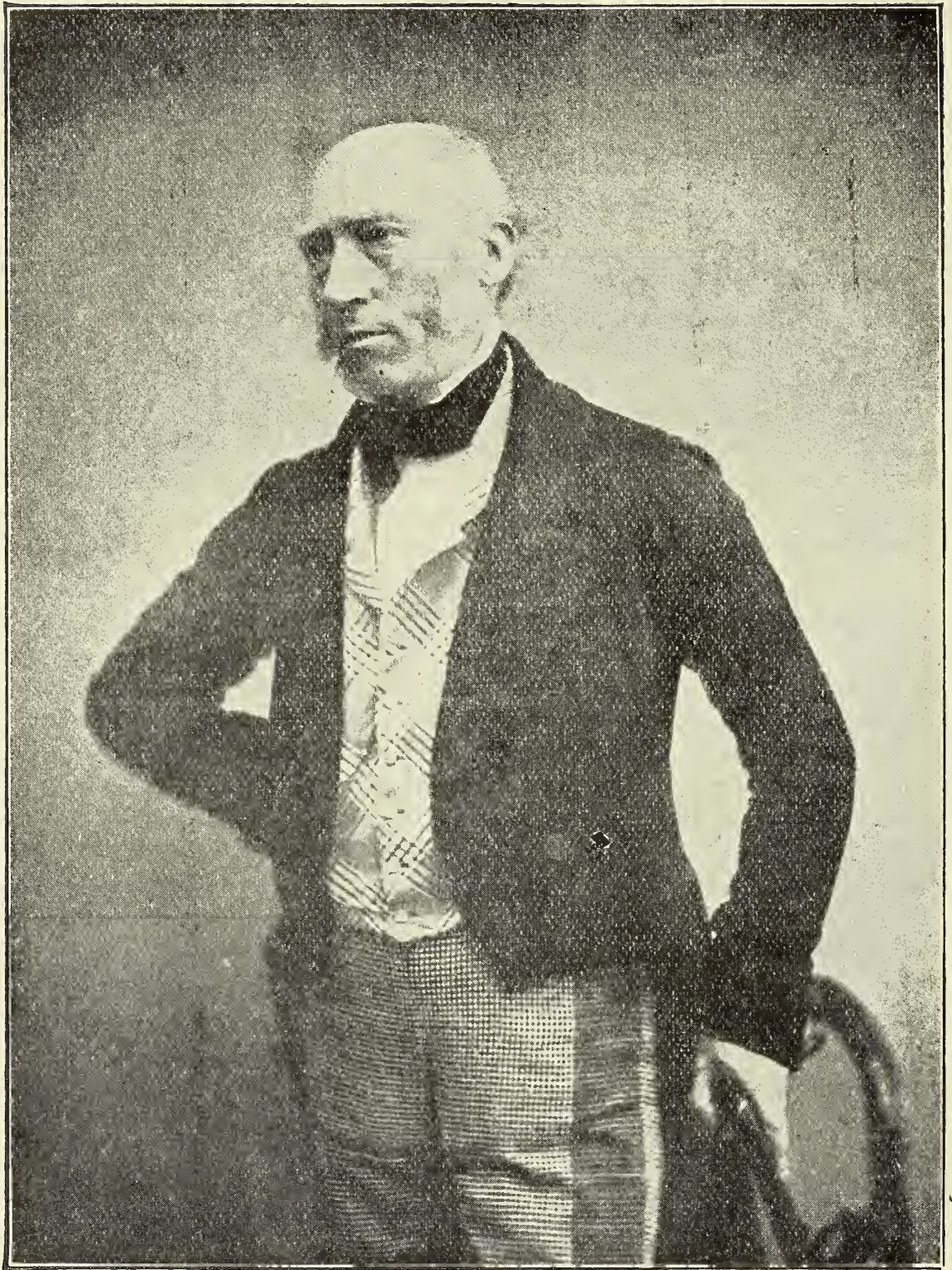
YORKSHIRE FLORAS.

Probably the earliest suggestion of a soil or geological map of Yorkshire was made by Martin Lister to the Royal Society in 1683. "An Ingenious proposal for a new sort of Maps of Countrys, together with Tables of Sands and Clays, such chiefly

as are found in the North parts of England, drawn up about 10 years since, and delivered to the Royal Society Mar. 12, 1683, by the Learned Martin Lister, M.D." (44). He says :—" It were advisable, that a *Soil* or *Mineral Map*, as I may call it, were devised. . . . The *Soil* might either be coloured, by variety of *Lines* or *Etchings*; but the great care must be, very exactly to note upon the *Map*, where such and such *Soiles* are bounded As for example in *Yorkshire*." He divides the County into four districts, viz. :—(1) The Woolds, (2) Black Moore, (3) Holderness, and (4) Western Mountains.

Much later, a suggestive paper, recalling many features in recent floras, was read before the Wernerian Natural History Society on May 31st, 1823, by J. Atkinson, of Leeds, on a " Sketch of the Geographical Distribution of Plants in Yorkshire " (2) In this he states that the flora of the county " consists of about 1400 species, of which upwards of 600 are Phænogamous, the remainder Cryptogamous." Lists are given of species characteristic of certain soils, he notes their distribution outside the county, and asks " May not the general type of the vegetation of a country be considered as indicative of its geology?"

In 1840 there was published at Halifax the first " Flora of Yorkshire," by Henry Baines (3). The introduction was written by John Phillips, in which he gives the first indication of that broader outlook on plant distribution which has been elaborated by later generations of Yorkshire botanists. Referring to contributions towards the knowledge of the distribution of animals and plants, he says :—" It is upon the evidence contained in local surveys alone that comprehensive inferences can be securely founded. In them the philosophic contemplator of nature ought to find exact if not complete data for correct reasoning; and if the districts are well chosen, not too limited in area, nor too uniform in physical constitution, conclusions of general value may be safely proposed upon an adequate basis of observed facts." In this brief introduction of 16 pages we have the outlines of botanical survey clearly indicated, and Phillips repeatedly refers to " vegetation " as distinct from " flora." He calls attention to Dr. Martin Lister's proposal for a new set of Maps to the Royal Society in 1683 (44), and the geological constitution of four great districts in Yorkshire. Phillips with greater insight recognises eight divisions, and in his account of these, briefly outlines the leading geological, topographical, climatic and edaphic features and their characteristic plants, and it is of interest that he clearly indicates for each division the " aspect of vegetation," and gives lists of peculiar and interesting species. This brief but very suggestive outline by Phillips, has been the basis for all our later Yorkshire floras.



JOHN PHILLIPS, F.R.S. 1800—1874.

About this time (1832–1852), H. C. Watson was industriously collecting and publishing data on the geographical distribution of British plants, and as early as 1836 (102) he suggested the preparation of maps showing the distribution of vegetation, as distinct from the distribution of species. At intervals from 1847 to 1859, his “*Cybele Britannica*” was published, which greatly influenced botanical research for many years (104–105).

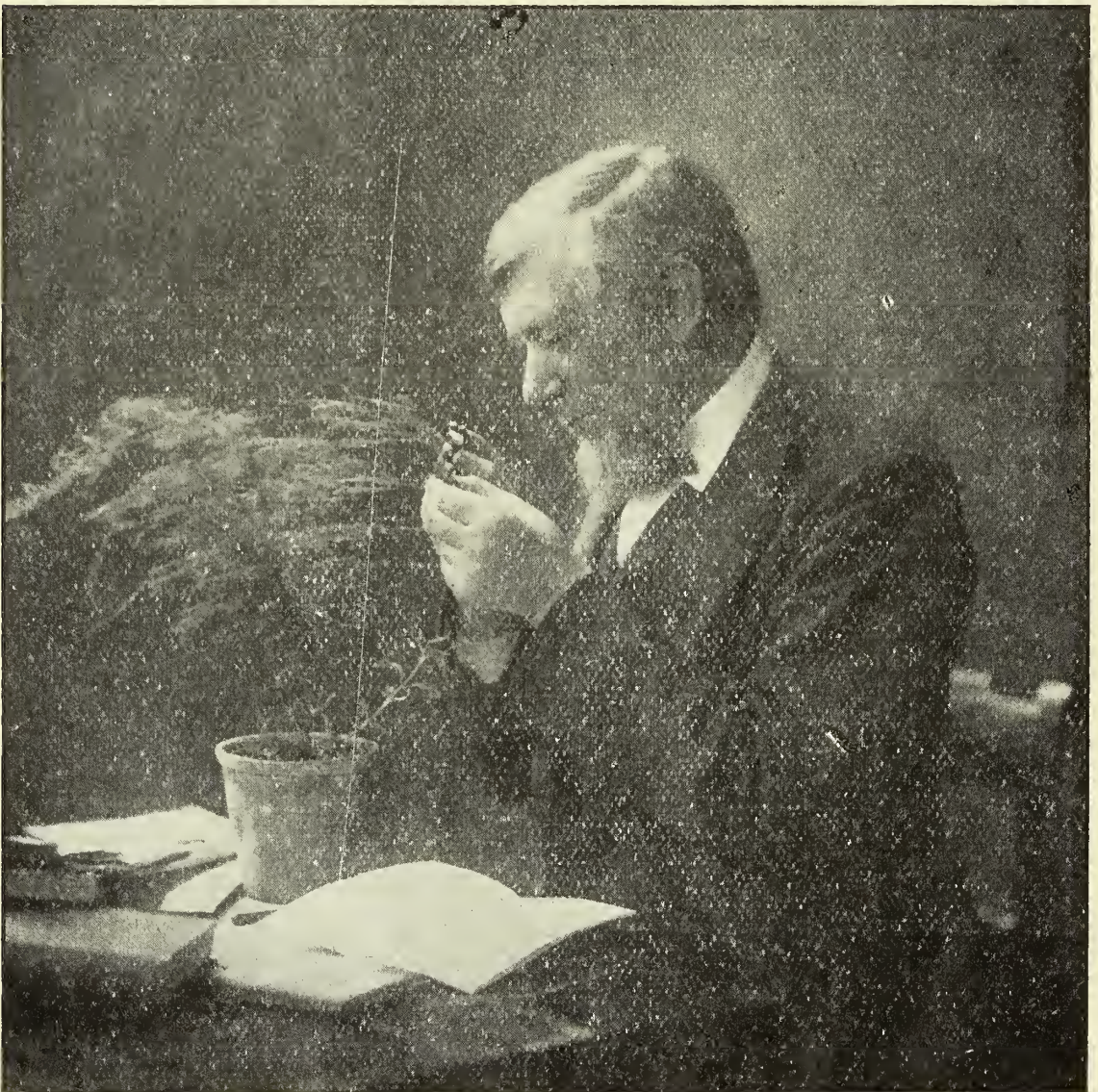
It was during this time, and after an interval of 14 years (1854), that a new edition of Baines’s flora appeared under the title of “*Supplement to the Flora of Yorkshire*” (4). The Phanerogams and Vascular Cryptogams by J. G. Baker, and the Mosses by John Nowell. A new introduction was written by Baker, in which he refers to the progress of the study of plant geography in Britain, and the investigation of the laws and conditions which govern and limit the distribution of species. He adopts from Watson four types of citizenship and seven types of distribution, and in a suggestive “*Outline of the Bearings of the Physical Geography of the county upon its Vegetation*,” he adopts Watson’s régions, Arctic and Agrarian, and draws upon Phillips’ earlier observations relating to geology, physical geography and vegetation. He sub-divides Watson’s three Vice Counties of Yorkshire into nine drainage districts, and deals in detail with the characteristics of those of the North Riding, which he selects with the object of pointing out “how the geological structure and physical aspect of the county are mirrored and reflected in its vegetation,” an essay which he further elaborated in his later “*Flora of North Yorkshire*.” The moss records in these two editions are due largely to Samuel Gibson, of Hebden Bridge, and John Nowell, of Todmorden, while Richard Spruce made many interesting contributions.

In 1862, a “*Flora of the West Riding*” appeared, by L. C. Miall and B. Carrington (48). This was a small work of 97 pages, the Phanerogams by Miall, and the Vascular Cryptogams, Lichens, Mosses and Hepatics by Carrington. An introduction on the lines of Baker was planned, but eventually its place was taken by a short and suggestive homily on the study of botany.

It was in the following year (1863) that Baker published his “*North Yorkshire : Studies of its Botany, Geology, Climate and Physical Geography*” (5). This work was printed at Thirsk, and with the exception of some copies sent out to subscribers, the entire edition was destroyed by fire at the author’s residence. This was reprinted in the “*Transactions of the Union*” between 1888 and 1892, and in 1906 was finally completed by a full account of the Mosses and Hepatics by Matthew B. Slater.

Baker’s introduction extends to 240 pages, and in it we have a masterly analysis of the factors influencing plant distribution in

the Riding, dealing respectively with the Geology, Lithology, Climatology, Topography, and Physical Geography. In his chapter on Lithology he follows Thurman (101), for the first time in this country, in his treatment of rock—soil types, and introduces his terms eugeogenous and disgeogenous, and considers the effect of these types on plant distribution. “The essential differences between the rocks of the two kinds are mainly in respect of their hardness, their power of absorbing and retaining moisture in small masses, their permeability when we consider them as form—



JOHN GILBERT BAKER, F.R.S., D.Sc. 1834–1920.

ing extensive strata, and the differences in their power of yielding detritus which result from these characteristics.” Here we have for the first time in an English flora, an attempt to analyse in detail the factors affecting distribution on a rational basis. His chief omission was the absence of chapters dealing more definitely

with what Phillips called the "aspect of vegetation," though he often comes very near it in his treatment of the drainage districts.

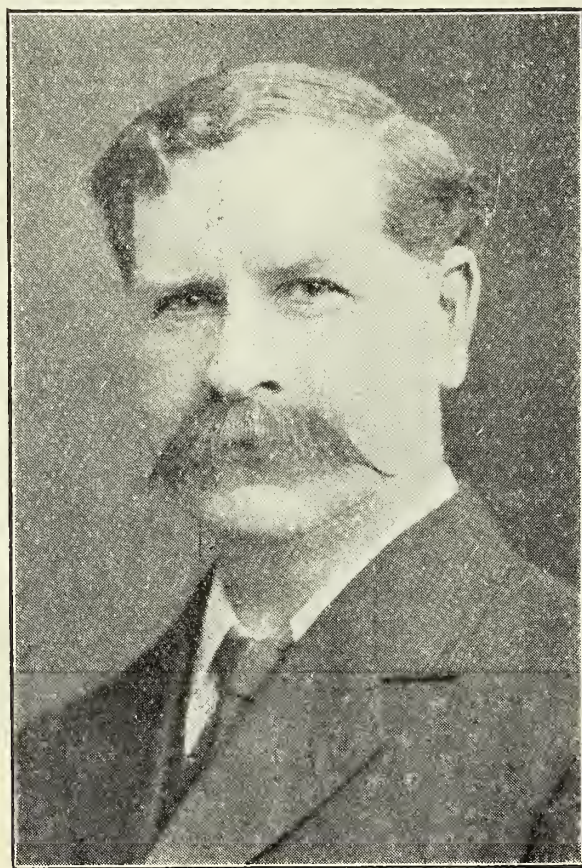
After an interval of 15 years (1878) J. W. Davis and F. Arnold Lees published "West Yorkshire" (21), being Part I. of "an account of its Geology, Physical Geography, Climatology, and Botany." This work was suggested by "North Yorkshire," which "furnished the model upon which to mould it," very appropriately the volume was dedicated to J. G. Baker and W. W. Newbould. In 1888 a volume appeared, by F. Arnold Lees. In this "Flora of West Yorkshire" (38), introductory chapters deal with climatology and lithology. In the former, Lees analyses the zonal range of the species in detail, and gives a brief but suggestive account of the genesis of the flora. In the latter chapter he follows Thurman and Baker and gives lists of characteristic species for the several types of rock soils. These important contributions to Yorkshire botany were rendered possible by the active and prolonged labours of members of local Natural History Societies in



FREDERIC ARNOLD LEES, M.R.C.S. Obit. 17 Sept., 1921.

the County. As Miall (48) pointed out, "those who make foolish objections to systems of names, as dry and unprofitable, may be reminded that the most valuable discoveries in science, and generally in philosophy, have been merely fresh combinations of facts known before." It has been one of the valuable functions of our journal, "The Naturalist" also the "Transactions" of the Union, to provide a medium for preserving the records and observations of the numerous and scattered workers in our county. By their means many useful local floras have been published which have been the framework on which to construct the more complete story of our vegetation. "The Flora of the West Riding claimed to be the most complete work of the kind ever issued for any district, including records of 1044 Phanerogams and Vascular Cryptogams, 11 Charas, 348 Mosses, 250 Lichens, 1009 Fungi, and 382 Freshwater Algæ, a total of 3160 species. These two volumes contain upwards of 1200 pages and three maps; a monument to the painstaking industry of several generations of amateur botanists.

After an interval of 14 years the flora of the county was completed by the appearance of the "Flora of the East Riding of Yorkshire" (79), by one whom we are glad to see still with us, James Fraser Robinson. To this was added a List of the Mosses



JAMES FRASER ROBINSON.

of the Riding by J. J. Marshall. With characteristic modesty Mr. Robinson adopted a less ambitious scheme than his North and West Riding colleagues. The East Riding presents a less varied topography and a much larger area under cultivation than the other two Ridings. This is shown clearly in his chapter on the "Physiography of the East Riding," with its sub-sections dealing with the Plain of Holderness, the Plain of York, and the Wolds. Out of a total area of 750,000 acres, 535,560 areas are under cultivation. Of the rest, which includes towns, villages, gardens, roads, waterways, etc., very little is occupied by primitive vegetation. Of commons and other ground, the area probably does not consist of more than 5000 acres, and this is continually diminishing. Notwithstanding these geographical disadvantages the flora is an essential contribution to our knowledge of the Flora of the County, and Mr. Robinson has placed us under an obligation for completing so valuable a piece of work.

In the cryptogamic sections of these floras, the authors were indebted to an able and active band of bryologists of which Yorkshire has produced so many. In addition to those already mentioned there were Chas. P. Hobkirk, William West and Robert Braithwaite, all past Presidents of the Union, also Richard Barnes and James Needham. William Ingham, who has done such solid and lasting service to Yorkshire bryology, is still with us, but it is with deepest regret we learn he is rendered incapable of pursuing the studies he loved so well. Our deepest sympathy goes out to him in his misfortune.

In addition to the three floras mentioned, the Union has rendered lasting service to Yorkshire botany by the publication of two cryptogamic works of exceptional merit. "The Alga Flora of Yorkshire" (107), by William West and his son, George S. West, in which 1044 species of these minute and interesting plants are recorded for the county. The work done by the two Wests in cryptogamic botany, has earned for them world-wide repute. The volume incorporates the valuable work of other algologists; especially noteworthy are W. Barwell Turner and George Norman.

Four years later (1905), a still larger work was published, "The Fungus Flora of Yorkshire" (47), a most painstaking work by two typical Yorkshire Naturalists, George Masee and Charles Crossland. This work may be fairly regarded as the result of investigations at successive fungus forays by the Mycological Committee of the Union. No fewer than 2626 species of fungi are recorded for the county. Crossland took up natural history relatively late in life, stimulated by his little daughter's entry into a flower competition. At 50 he learnt to draw and was greatly influenced by the work of James Bolton. By continuous effort he became one of the leading British fungologists, and his careful

drawings of fungi, including microscopic details and spore measurements, were eventually purchased for the National collections at Kew.

Exhaustive as these floras are, since their publication very considerable additions have been made to our knowledge of the flora of the county, evidence of this is seen in the M.S. left by the late F. Arnold Lees, which we hope may be published at no distant date, also the additions to the Fungus Flora recently compiled by Mr. Alfred Clark, which contains more than 400 records in addition to those published in 1905 by Massee and Crossland. With the completion of these floras, botanical research in the county was by no means exhausted. Rather, we look upon this work as laying the foundation and supplying the material for more prolonged and detailed study. These floras give us the first complete outline. We have now to fill in the details and extend the scope of our investigations. We are well aware that the publication of a great and exhaustive work tends to produce a feeling of rest and satisfaction. Now is the time to retire from our labours and calmly survey the results. This feeling, however, is incompatible with youthful vigour, which soon finds a new outlet for its energy, and while we older ones look on, the younger generation picks up the threads, and soon entangles itself in a mesh of new and unsolved difficulties. The earlier work of systematic botanists and plant geographers in our county certainly laid the foundation for a new structure, and provided abundant material for a new botanical outlook.

The story of Yorkshire botany is the story of men feeling their way, not merely as some suppose for long and complete lists of species, but behind it all is the consciousness of the presence of those forces in nature which, by their complex interaction, are not merely moulding the forms of our species, but determining their mode of life, of distribution, and of final extinction. In short, the ever present problems of life, its origin, behaviour, meaning and fate.

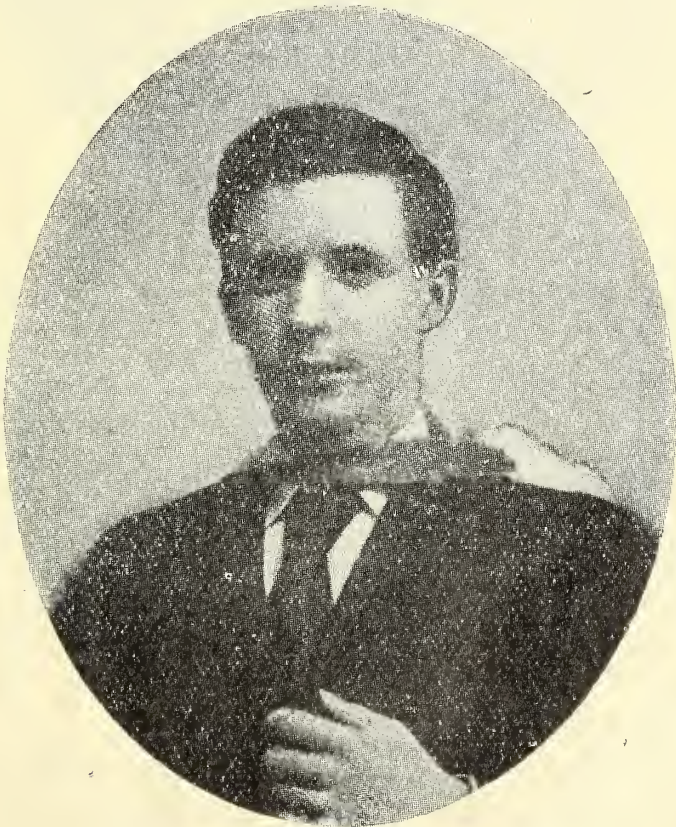
BOTANICAL SURVEY AND VEGETATION MAPS.

It was at this stage of our botanical history that a young Scotsman—Robert Smith—under the influence of Prof. Patrick Geddes, of Dundee, and Prof. Ch. Flahault, of Montpellier, brought to the notice of botanists more clearly than ever before, the idea of a vegetation survey, as distinct from, or as a complement to floristic studies, though, as we have seen, the idea had been in the minds of botanists for a long time. Smith's method, however, was not a mere development of previous lines of work, he introduced a new and broader outlook as well as a deeper insight into the meaning and significance of vegetation. Flahault, for

example, in his botanical survey of France, based his work on the distribution of trees, and recorded by colours on maps the areas of distribution of the characteristic species.

Robert Smith showed that this method was not applicable in Scotland (84-85), and that it would give a very inadequate, if not erroneous, impression of the plant-covering of the country. He pointed out that in Britain, the plant carpet is formed by a type of vegetation lower than the arboreal, such as the cultivated plants, the grasses, the heaths, etc.; the woods occur only here and there. His main divisions, therefore, have been determined by this lower vegetation, whilst the trees are only indicated over areas which they actually inhabit (84).

From this point of view, the vegetation of a region is regarded as an aggregation of plants adapted to life in this region. Within each aggregation there are *associations* or smaller groups of plants, whose distribution is determined by particular conditions of life. Within each plant association there are grades of successful adaptation, and the plants group themselves as dominant, secondary, dependent and isolated species. The study of these plant associations is a method of studying the vegetation of a district. In a floristic study, the chief point of interest is to discover the isolated species; when plant associations become the subject of observation, the dominant and secondary species com-



ROBERT SMITH, B.Sc. 1874—1900.

mand first attention, *i.e.*, those which have a gregarious or social habit. The study of vegetation recognises that there is a close connection between the plants of an area and the prevailing conditions of soil and climate, and that these associated plants have an ecological relationship.

In a floristic study special attention is paid to floral characters. In a vegetation study the essential characters of the species are those indicating adaptation to the environment, and are to be found mainly in the vegetative organs. It is on these adaptive characters that the ecologist recognises communities and societies.

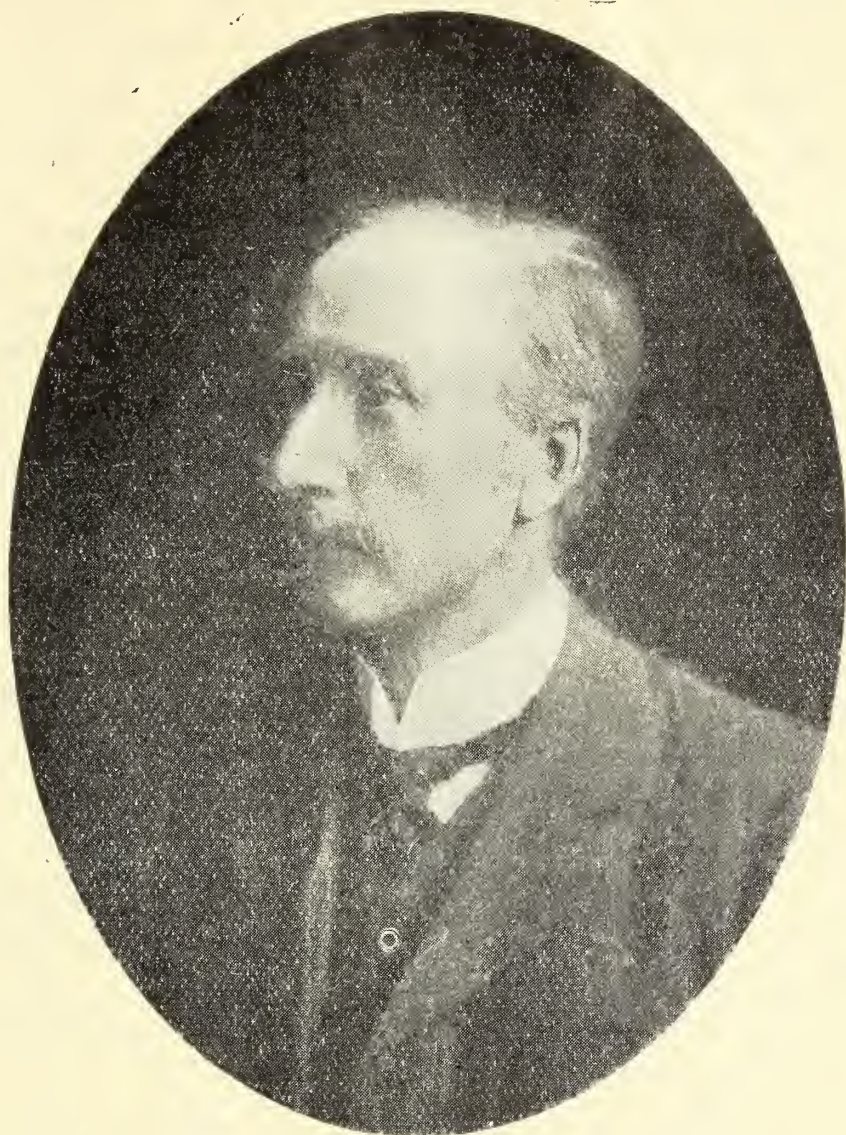
The first attempt to study vegetation in Britain on these lines was made by Robert Smith, and his papers in the Proceedings of the Perthshire Society of Natural Science in 1898 and 1900 on "Plant Associations of the Tay Basin" (82), will be of permanent interest in this connection.

In 1899 he published, together with a full bibliography, a paper "On the Study of Plant Associations" (78). In 1900 appeared his first vegetation map of the "Edinburgh District" (84). He had made considerable progress with his botanical survey of Northern Perthshire (85), when a sudden illness cut short a very promising career.

His brother, Dr. Wm. G. Smith, at that time in the Biological Department of the University of Leeds, took up the work and saw the "Botanical Survey of Northern Perthshire" through the press, and completed the survey of Forfar and Fife (93). In 1906, M. Hardy published a Vegetation Map of the Highlands (27). This brought to an end, for the time, the project for a "Botanical Survey of Scotland."

Dr. Wm. G. Smith, recognising the value of this line of botanical research, had already determined to apply the method to Yorkshire, and inspiring his students, C. E. Moss, W. Munn, Rankin and your President, a survey of the Vegetation of Yorkshire was planned. This was begun in 1898, while Robert Smith was still engaged on similar work in Scotland. In 1902, Moss (52) gave an account of the plant associations of the "Moors of South West Yorkshire," and a few months later appeared the first vegetation map, the "Leeds and Halifax District," by W. G. Smith and C. E. Moss (90), which was published in the "Geographical Journal" for April, 1903. This dealt with an area of 1700 square miles, including a considerable part of the moorlands of the Southern Pennines. The plan outlined was that of Robert Smith (82-84), and included :—

1. The chief zones or regions characterised by definite plant associations, into which a district may conveniently be divided.



WILLIAM G. SMITH, B.Sc., Ph.D.

2. The particular conditions of soil and atmosphere which distinguish each zone or region.
3. The adaptations of plant species to their environment.
4. The relations existing between the species—that is, which species are dominant, which sub-dominant, and which dependent upon the dominant species for shelter or for food.
5. The influence of animals and of man upon the associations.
6. The general conditions of climate and of vegetation in the district compared with those in other districts.
7. To ascertain the origin of the heather moorlands and the extent of our primeval forests.

This survey of the Leeds and Halifax district was accompanied by a map of the area on the $\frac{1}{2}$ " to the mile scale, showing the distribution of the several types of vegetation in distinctive colours.

In August of the same year (1903) appeared Part II., by Smith and Rankin, on the " Harrogate and Skipton District " (91). These were the first vegetation maps to be published in England.

In the following year, F. J. Lewis published 2 maps with an account of the " Geographical Distribution of Vegetation of the Basins of the Rivers Eden, Tees, Wear and Tyne " (39). One of these included the very interesting area of Upper Teasdale, and resulted in adding several new features to our knowledge of Yorkshire vegetation. For the first time he described the occurrence of Sphagnum bogs on the Pennines, an observation confirmed a little later by Dr. Smith and myself (94).

Lewis also recognised in the peat " a succession of plant beds, 2—8 inches in thickness, separated by layers of stiff grey glacial clay. The plant remains of these different beds are very dissimilar, and show that considerable climatic changes have taken place." No remains of this kind have yet been observed in the peat of the Southern Pennines.

Lewis considered that the chief factors governing the distribution of the plant associations he studied were :—

1. The chemical composition of the soil water, such as proportion in which the various salts occur, and the state of combination in which they may exist.
2. Physical characters of the soil, such as texture, proportion of air and water retained, etc.
3. Climatic conditions, such as slope of land, aspect, drainage, altitude.
4. Artificial agencies, influence of man and other animals."

The maps accompanying Lewis's papers are on the 1 inch to the mile scale, a distinct improvement on the smaller maps of the Southern Pennines.

Outside the county, Moss commenced a survey of the vegetation of Somerset, and in 1907 the Geographical Society issued the " Geographical Distribution of the Vegetation of Somerset : Bath and Bridgewater District."

Meanwhile, Dr. Smith made considerable progress with a survey of the Cleveland area, and I undertook an adjoining area immediately to the South. Difficulties, however, were being experienced with the heavy costs of publication, and these surveys of East Yorkshire were not issued (120, p. 18).

Efforts were made to induce the Ordnance Survey to undertake the publication of Vegetation Maps, and a map of the Peak District, including part of S.W. Yorkshire, was prepared in proof by the Survey, but unfortunately the treasury decided not to grant the necessary funds. Fortunately the Cambridge University Press took up the work and published in 1912, the most detailed account of the vegetation of an area yet attempted in "The Vegetation of the Peak District," by C. E. Moss (56). With this was issued 2 maps of the area on the inch to the mile scale. The publication of this work brought to an end general vegetation surveys in this country, though several other areas were mapped.

It is greatly to be desired that a vegetation survey of Yorkshire on the inch scale will some day be accomplished, as such maps provide the basis of much valuable work, both scientific and economic.

While the early primary surveys were in progress, my attention was occupied on a rather different aspect of the problem—an attempt to test the value of a more intensive study of the dominant types of plants than was possible in a general survey. An area in the neighbourhood of Huddersfield was selected and surveyed on 6 inch and 25 inch to the mile maps (113). In addition to emphasising the facts brought out in the primary surveys, special studies were made of the growth forms and influence of the environment on structure, the persistence of species under a wide range of habitat conditions, and the importance of the study of the plant as a whole, root as well as shoot systems, in the development of plant associations. It showed the existence of Complementary Societies within Woodland Associations (112-113), an idea which is now being extended to the Association as a whole. A comparison was made between the distribution of the present woodland and that of the primitive forest as indicated by the distribution of woodland species and the remains of trees in the peat.

Since these studies began, now more than 20 years ago, intensive studies have been made in very many directions by members of the Union. Meanwhile, survey work was making its influence felt beyond the borders of our county.

On December 3rd, 1904, a meeting was held at the house of Dr. Smith, in Leeds, to discuss the position of vegetation survey in Britain. The meeting was attended by Dr. W. G. Smith, Messrs. C. E. Moss, A. G. Tansley and T. W. Woodhead, while Messrs. M. Hardy, F. J. Lewis, R. Lloyd Praeger, W. M. Rankin and Dr. G. H. Pettybridge wrote expressing their sympathy with the objects of the meeting. It was resolved to form a Committee to advance the interests of botanical survey, to be called "The Central Committee for the Survey and Study of British Vegetation." The Committee was restricted to a dozen members, and

after an existence of about 9 years, and largely from demands for membership by a wide circle of botanists, the Committee resolved itself into the British Ecological Society, founded in April, 1913, at a meeting held at University College, London. An official journal was established for the publication of the results of ecological research and notices of the world's ecological literature. In anticipation of the formation of this Society, the first part of the "Journal of Ecology" was issued on the 1st of March, 1913, and is now one of the leading publications on this branch of botany, with a world-wide circulation. The pages of "The New Phytologist" reveal much active work by the members, while "The Naturalist" has provided the means of publishing the results of very many valuable observations on the Vegetation of the County. These publications, also Tansley's "Types of British Vegetation" (98), give striking evidence of the rapid progress made in the study of Vegetation in this country.

The year 1904 was one of great activity in Yorkshire ecology. It saw the completion of the "Flora of Halifax," by W. B. Crump and Charles Crossland (16), which was begun in 1896, and appeared serially in "The Halifax Naturalist" during the succeeding years. This flora is of special interest in that it was the first product of the new outlook, and it marked a great advance on previous local floras. Its outstanding features being (a) a very careful analysis of the plant associations of the district, (b) the special attention paid to the habitats of the species recorded, and (c) a very painstaking account of the Mosses, Hepatics and Fungi, by Charles Crossland, and as might be expected by anyone who had the privilege of knowing him, the cryptogamic records exceed in number any previous attempt for such an area. In this work he had the active assistance of James Needham. No attempt, however, is made to link up the associations of phanerogams and cryptogams. That remains for the future, and interesting results may be safely predicted from a complete study of the phanerogams and cryptogams characterising our chief plant associations.

Another interesting piece of local work was the investigation of "The Vegetation of some Disused Quarries" by Samuel Margerison (46). This was a study of the origin and development of the vegetation on the quarry tips of Calverley Wood, between Bradford and Leeds. Margerison carefully worked out the making of the soil, the pioneer vegetation, soil gatherers and binders, and the succession of associations leading to the closed association of a woodland flora.

The idea of "succession of plant associations" had been impressed on ecologists for some time, and is now recognised as playing an important part in the present distribution of vegetation.

The theory is that vegetation in any habitat starts with a few individuals which form an open association, the early invaders often being lichens and mosses, and passes through a succession of phases from open to closed associations, *e.g.*, of grassland or scrub, till it reaches a final and relatively stable phase which on many soils is a type of woodland. The study of these progressive phases of vegetation has become an important part of botanical surveys.

These surveys have done much to extend the outlook of botanists and have been fruitful in opening up new and profitable lines of research. Some of these we will briefly consider.

WOODLANDS.

The observations recorded in the surveys of Yorkshire Woodlands referred to above, led to an examination of the woodlands over a considerable part of the country, and an attempt to systematise the various types was made by Moss, Rankin and Tansley in "The Woodlands of England" (57), and in the same year (1910) appeared Moss's "Fundamental Units of Vegetation" (55). On the economic side mention should be made of the contributions of Margerison (45), Smith and Crump (15), on the "Utilisation of Waterworks Gathering Grounds by Afforestation."

The observations of J. W. Barry in 1907 on the "Sylvan Vegetation of Fylingdales" (9), as to the significance of the Mountain Elm (*Ulmus montana*) and the Common Ash (*Fraxinus excelsior*) at the heads of ravines and the narrower dales in the county, and that these trees formerly occupied a more conspicuous position in the upland vegetation than they do to-day, have been fully verified during recent excursions of the Union.

Our studies of tree remains in the peat of the Southern Pennines in the neighbourhood of Huddersfield (120 p. 30), have considerably extended our knowledge of the distribution and nature of our primitive forests, and suggests that the degeneration of the pennine forest began anterior to Roman times and was initiated rather by natural retrogressive conditions, than to the activity of the Roman legions, though the latter, and perhaps the Britons before them, may have contributed to and hastened the result.

The depression of the tree-limit on the Pennines which we witness to-day, is probably due to the leaching of the high ground of the Pennine plateau, the progressive increase in acidity, followed by peat development favoured by the high rainfall and the anærobic conditions consequent on a waterlogged soil. In this connection, the valuable work now in progress on the acidity gradient and Hydrogen-ion concentration in the soil, also Dr. Pearsall's work on basic-ratios and plant distribution (65), are already yielding helpful results. A promising piece of work on the vegetation of Martin Beck Wood, was cut short by the death of Mr. H. H. Corbett.

A gap in our knowledge of plant associations is the role played by the Cryptogams in the development of the vegetation. One of the early attempts in this direction was made in 1903 and 1904 by Chas. Crossland and James Needham in their study of the Mosses and Hepatics of the Parish of Halifax, and of "The Plants of Pecket Wood" (13-14).

In this connection might also be mentioned the interesting contribution by Mr. Burrell on "The Mosses and Liverworts of an Industrial City" (11). A very detailed piece of work on these lines was in progress by J. R. Simpson, on "The Mosses of Hagg Wood, near Huddersfield" (81), but was unfortunately incomplete when he removed from the county.

Much work lies in front of us in the study of retrogressive phases, while in the regeneration of the forest, we have excellent examples at hand awaiting investigation. The part played, not merely by bacteria and moulds, but also by the higher fungi, would repay investigation. Studies of the cryptogamic flora in the associations of higher plants would do much to emphasise the wide range of habitat conditions within the associations, while the biology of the soil presents many unsolved and intricate problems of great importance.

MOORLANDS.

It is probably safe to say that the vegetation of the Pennines has been more thoroughly studied than that of any similar area in Britain. An early and interesting contribution was made by Moss in his account of the "Moors of South West Yorkshire" (52), and in more detail in his "Peat Moors of the Pennines; their Age, Origin and Utilisation." (53).

It was not until Moss surveyed these moors that the significance of the Cotton-grasses (*Eriophorum vaginatum* and *E. angustifolium*) in the vegetation of Moorlands was recognised, and it was he who first called attention to what is one of the most striking plant associations in the British flora. That such features should have been before the eyes of botanists from the beginning and still remain unrecognised, is an indication of the value of the ecological outlook.

Peat, and the moorland plants growing on it, have attracted much attention. The work of Lewis has been already mentioned and he carried his investigations into the Scottish peat moors with very important results (40-41). In this connection mention should also be made of the work of Crump on "The Water-content of Acidic Peat" (18). "The Co-efficient of Humidity" (19), and the "Wilting of Moorland Plants" (17), also Johnson's useful comments on these (31). Just across the border Rankin has given a

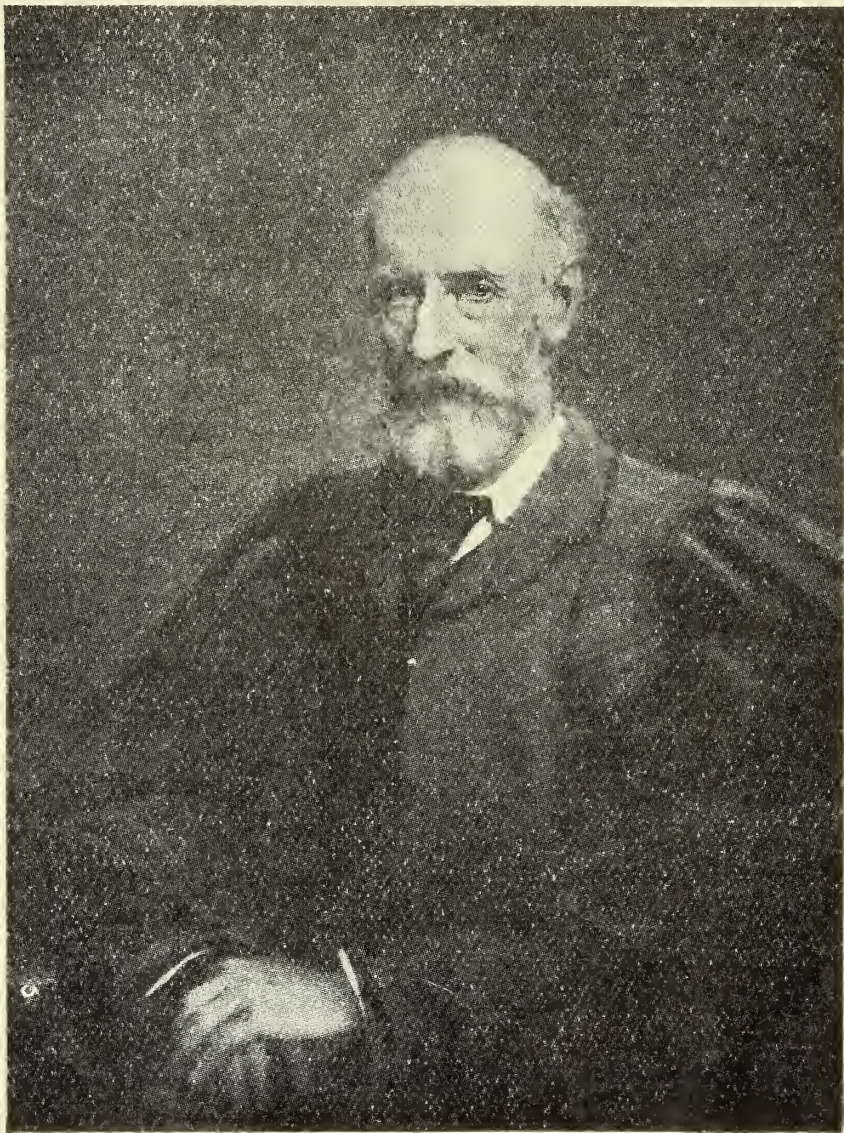
good account of the " Peat Moors of Lonsdale " (75). At this time Elgee was studying the Cleveland Moors, giving special attention to the Vegetation of " Swiddens " (23), and " Glacial Survivals " (22), and Miss Elsie D. Whitaker worked out some interesting details of the tree remains in the peat of the Whitby and Scarborough Moors. We are looking forward to important results from Messrs. Cheetham and Burrell in their study of Austwick Moss and on the constituents of peat. In connection with their work, Prof. Gilligan has given us a helpful " Note on the soil below the Peat on Moughton Fell " (26) in relation to the formation of pan. A valuable contribution to our knowledge of Moorland plants was made by T. A. Jefferies in his studies of the Purple Heath Grass (*Molinia caerulea*) on the moors near Huddersfield (29-30). In these he established important facts relating to its mode of growth, its relations to the supply of fresh water, to other moorland associates, e.g., Cotton-grass and Mat-grass, and to the vegetation of woodlands. An interesting study of this grass has also been made by Miss Mary F. G. Lister (43). More recently Dr. Smith has contributed an interesting study on the " Distribution of *Nardus stricta* in Relation to Peat " (97), in which he confirms Jefferies' observations. Smith and Crampton (96), and Adamson (1) have also contributed papers having an important bearing on studies of the Vegetation of Yorkshire Moorlands.

Survey in the Cleveland area was greatly assisted by the classical researches of Prof. P. F. Kendall on the " Glacier Lakes of Cleveland " (34) which appeared in 1903. Four years later, Frank Elgee (22-23) published some results of his study of this area, and in 1912 Messrs. Brown issued his completed work on the " Moorlands of North Eastern Yorkshire " (24). Elgee dealt with many aspects of these Moorlands, including the relation of the Ice Age to the Moorland flora, also the animal life of the Moors. Two maps accompany the volume, a geological map and one indicating the area covered by moorland vegetation. No attempt was made, however, to map the plant associations. That is still a desideratum, and it is hoped that the maps prepared by Dr. Smith may some day be published.

Elgee's work is the first considerable attempt in Yorkshire definitely to correlate the fauna of an area with the vegetation. In this connection mention may be made of the study of Mollusca in relation to plant associations by Kendall, Dean and Rankin in 1909 (36). Relatively little, however, has been done in the study of animal associations. The prolonged observations of Woodruffe Peacock on the Rock-Soil Method (59) were remarkable for their originality, and the publication of the manuscript he left on this subject is much to be desired. For many years he was a constant contributor to " The Naturalist " and his " Ecology of Thorne Waste " (60) was a very characteristic piece of work.

In addition to the anatomical studies of plants in works already mentioned, the biology and anatomy of moorland plants formed the subject of a delightful study in 1898, by Miall, in his lecture at the Royal Institution, on "A Yorkshire Moor" (49).

In addition to anatomical studies in works already mentioned, Miall devoted much time and thought to the investigation of the life histories of animals and plants, excellent illustrations of which are seen in his "Natural History of Aquatic Insects" (1895), "Round the Year" (1896) and "House, Garden and Field" (1905). The biology and anatomy of moorland plants



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engaged his attention and formed the subject of a delightful lecture on "A Yorkshire Moor" (49), delivered at the Royal Institution in 1898.

After a long interval their study has been revived by his successor, Prof. Priestley and his students (68-74). I anticipate that their researches on casual anatomy will lead to discoveries of far-reaching importance, and already they are bringing us to closer grips with those striking adaptations which are so conspicuous a feature in our commonest and most widely dispersed Yorkshire plants. The factors of the environment are complex and difficult to analyse, hence the widely divergent explanations of these remarkable modifications of form and structure. Whether these are epharmonic adaptations or not, remains for future investigations to decide.

Dr. Harold Wager has made many valuable observations on plant growth and behaviour, few of which, however, have been published. If he could bring these together in a volume, say on "Plants as Playthings," he would render a useful service to the cause of natural history research.

The most helpful line of research is that of life-histories, and in the study of the plant, we not only need the history of its life, but we need to probe more deeply into the mystery of its death and decay.

GRASSLAND, MARITIME AND AQUATIC VEGETATION.

The Woodlands and Moorlands which occupy such a large part of our county have naturally received chief attention, but many valuable researches have been carried out on other types of vegetation.

One piece of work, of which we have too few examples, is R. C. Gaut's "Botanical Survey of a Pasture" (25), a concentrated study of the grassland flora of part of the farm at Garforth, in relation to soil conditions and former history of the vegetation.

The vegetation of flushes (116) although it has received considerable attention by ecologists, deserves more detailed study.

Maritime and Salt Marsh Vegetation would repay more detailed investigation as shown already by the work of Robinson (80) and Stainforth, also by the study of *Statice Limonium* by Petch (66) and Heslop Harrison's "Survey of the Lower Tees Marshes and of the Reclaimed areas adjoining them" (28).

A delightful introduction to the study of Marsh and Aquatic Vegetation was written in 1899 by one of our former Presidents, A. H. Pawson, on "Water Plants as Land Winners" (58). Since then much work of permanent value has been done by members of the Union. Of the early contributions mention may be made of Dr. Smith's "Notes on the Vegetation of Ponds" (92), my life-history of the Flowering Rush (115), and Mr. Wattam's account of

the Vegetation of Buckton Marsh (106). Mr. Burrell's investigations on the distribution of mosses in relation to water hardness (120, p. 20) and Messrs. Stiles and Butcher's studies of the plankton of streams and rivers, are following up the excellent work of Barwell Turner, W. and G. S. West, and R. H. Philip. But the work of which we have most reason to be proud is that on Marsh and Aquatic Vegetation which has been carried out with such brilliant results by our Secretary, Dr. Pearsall (61-64). These studies of Lake Vegetation are of fundamental importance and will take their place alongside the best work hitherto accomplished on Water Plants and the factors affecting their growth and distribution.

I have endeavoured to introduce the ecological outlook in my "Study of Plants" (117a), in the hope that it will give wider significance to the subject and deepen the interest of the student of botany.

HISTORY OF THE FLORA.

The Alien flora has long attracted many of our botanists (37-114) and when the full story of its origin and distribution is written, we shall be surprised at the extent of man's interference, and the devious tracks along which the new arrivals have reached their present habitats. Nevertheless, nature has a way of exerting herself, and imposing her influence on man and limiting his operations.

Much has been written in recent years on the origin of the British flora, and vegetation surveys, especially studies relating to the development of vegetation, have given renewed interest to the subject. It may be worth while to devote a few moments to the consideration of its latest aspect.

The classical researches of Clement Reid (76-78) are of the greatest value in this connection, and form a safe foundation for future work. Respecting glacial survivals, Reid (77) asks the question, "Are any of our plants survivors that managed to live through the cold of the Glacial period in some warm nook in Britain? They evidently found a refuge somewhere, for we know that the same temperate species that live in Britain now were here in pre-Glacial times. But was this refuge in Britain?"

"Here geology comes to our aid, and I think that all geologists who have made a special study of the climatic conditions will agree with me. Any survival of our flowering plants, except in the case of a few arctic and alpine species, was quite impossible."

Our studies in the origin of the flora of S.W. Yorkshire, with Huddersfield as a centre, lead us, however, to a conclusion different from that advocated by Clement Reid. In our view, the point of

importance is to discover the species capable of growing under the conditions found in an arctic region, rather than to concentrate on those species regarded as arctic or alpine.

In the neighbourhood of Huddersfield we have 784 species of phanerogams and ferns. Of these, 451 are either weeds of cultivation or dependant on man for their persistence. In addition, there are 33 species of aquatics confined to artificial waters, leaving only 300 which may be regarded as "natives" in the strict sense of the term; *i.e.*, plants which grow in and are characteristic of, a natural habitat, and do not owe their existence to man's operations, nor to that of his domesticated animals. Of these 300 species common in our moorlands, cloughs and deans, 226 occur now within the arctic circle, and most of the remainder in Siberia, so that cold alone would not prevent their persistence in the area in Glacial times. Further, they are much hardier than many of the so-called arctic and alpine species. The latter, during the severest season, are accustomed to a protective covering of snow, and are quite unable to withstand the intermittent exposure in winter to which our moorland species are now subjected.

Let us consider our moorland flora from another point of view. A number of the species, belonging chiefly to the families Rosaceæ, Empetraceæ, Ericaceæ, Juncaceæ, Cyperaceæ, and Graminæ, are of great importance in the vegetation of the area. At the present time, they cover nearly half the drainage area of the Calder, and but for man's interference by cultivation, would have a much wider range. Only two or three of these species come within the usual definition of arctic or alpine, and occur also on the mountains of Scotland, the Lake District, and North Wales. Yet we find that all the other species are quite capable of withstanding conditions prevailing in the arctic regions, are characteristic of our moors and cloughs to-day, and cover a larger area than any other constituents of our flora. The same may be said of Yorkshire as a whole, *i.e.*, that the common species of our moorlands cover a larger area in the county than any other group of plants.

A further point of interest is that our peat investigations have shown that the dominant moorland plants can be traced backwards to the earliest days of peat formation, and it is noteworthy that no species have yet been revealed in the peat of the Southern Pennines, which do not occur on our moors to-day. This is not so, as we have seen, in the Northern Pennines (39). The oldest remains we have so far discovered in the Southern Pennines are those of Ling and Bilberry, several inches below the base of the present peat, among flint implements said to be of palæolithic age (*Azilian-Tardenoisean*).

It is conceivable, however, that a so-called arctic flora preceded that of which we have remains to-day, and has left no trace behind, perhaps dying out from the stress of winter exposure resulting from the advent of a warmer climate. In either case, a land surface free from ice and snow in the summer is necessary, and if it is true, as our glacialists maintain (*e.g.*, Lewis (42), Kendall (34-35), Carter (12), Jowett (32-33), and others) that the Cleveland area and the Southern Pennines were ice free during the Ice Age, though as I have shown (119) there are numerous scattered deposits of boulder clay south of the Calder, in the drainage area of the Colne, nevertheless, we had large areas in our county suitable for the persistence of our moorland flora from pre-glacial through glacial, inter-glacial and on to post-glacial times. Thus our investigations of the remains of the earlier vegetation indicate that with few exceptions our present moorland plants are the oldest of which we have definite evidence, and that of our native species they cover the largest area in the county.

It is of interest to compare this result with that arrived at by Willis by quite different methods, in his study of the flora of Ceylon (108), and more recently of other areas (109). He says, in defining his law of "Age and Area," that "the area occupied by any given species at any given time, in any given country, is to a large extent an indication of the age of that species in that country." Adapting this to our Yorkshire flora we may say, that the very large area occupied by moorland species, at the present time is to a large extent an indication of the age of those species in the county and as they occupy a much greater area than any other group in the natural vegetation of the county, they are probably the oldest elements in our flora.

When we fully appreciate (*a*) the large proportion of "aliens" in the British flora, (*b*) that *cold* as a limiting factor has often been exaggerated, (*c*) that many of our "natives" are able to live under the conditions prevailing in the arctic regions (*d*) that we had large areas free from ice and snow in summer where such species could persist—then the difficulties concerning the re-population of these islands are to a considerable extent minimised. Further, when we consider our tree and shrub flora we find that remains of species like Birch, Alder and Raspberry occur in Early, Inter, and Late-Glacial deposits. In the latter the Sallow and Scots Pine also occur. Most of our present common trees and shrubs formed the chief constituents of the Inter-Glacial forests. These facts are significant when we keep in mind the imperfection of the record.

With such a flora as has been suggested above, it is not difficult to visualise the re-establishment of the forest in Neolithic times, and this in turn as we have seen, was doomed in great measure to be overwhelmed, not by ice, but by the development

of the peat which is bearing our present moorland flora, relics of this forest being still preserved in the sheltered cloughs and gills of the Pennines.

To me the facts do not suggest a wiping out of the pre-glacial flora and a re-invasion from the continent, but a succession of associations in the non-glaciated areas, followed on the retreat of the ice, by a re-invasion of the adjacent, previously glaciated, areas, largely by the same species. Subsequently this flora was reinforced by dispersal from the continent, aided in an important degree by man. This would not settle the origin of the British flora, but it would bridge the gulf which has been the great barrier in the past.

Our vision of the past has been greatly extended and cleared by the palæobotanical studies of members of the Union. In this direction the researches of Dr. H. Hamshaw Thomas on the "Jurassic Flora of Yorkshire" (94, 114 p. 27) are reaching a stage in their progress when more successful efforts can be made to link the past with the present.

REGIONAL SURVEYS.

The methods of study of these ecological problems differ according to the standpoints of the various workers, and this variety of attack is its most hopeful and promising feature.

The significance of this work is that it has brought together the biochemist and physiologist, the histologist, morphologist and systematist, who have too long worked in isolation, and forced their attention once again on the fundamental problems of the relation of the plant to its environment, an outlook which seems to have been almost forgotten by certain schools of biologists. If ecology has done nothing else, it has justified itself in proving and emphasizing the inter-dependence of these various branches of botanical study. Just as floristic studies made possible botanical survey, and this gave point and impetus to ecological studies, which in turn brought within its meshes the scattered branches of botanical research, so also has it shown us once more the dependence of our study upon geology, topography, meteorology, and, may I add, anthropology. These inter-relations have always been admitted. Unfortunately they have been too often neglected or overlooked. As Prof. F. F. Blackman (9) has said, "Ecology widens the botanical horizon enormously by insisting upon our adding what may be called the sociological outlook to the various other ways in which plants have been regarded."

This is no mean achievement, and when its history comes to be written much credit will be due not only to Robert Smith, the founder of British ecology, but also to the stimulating lead of Dr. W. G. Smith, and the work done by him and other members of the Yorkshire Naturalists' Union.

These studies, as we have seen, all relate to and concern our own immediate environment, and when the question arises of man's influence on the distribution of plants, other wide fields of research are opened out to us which involve the history, development, and distribution of man himself (120 p. 18)*

These interactions present many interesting problems of great scientific and educational interest, and call for more intensive local studies on many lines and by many groups of workers.

So important are these in broadening and deepening our outlook, that I feel constrained to renew an old plea for greater encouragement of systematic and carefully organised studies of local history, both natural and human.

We have recently been reminded of the functions of museums and the question has again been raised whether local museums are worth the cost of upkeep. In the minds of some this seems doubtful, and often expenditure on them is tolerated rather than encouraged.

From what has been said, it is obvious that a carefully selected area around any Yorkshire town will provide an abundance of material of the utmost educational value, for display in the museums (118). Directors and curators of museums seem agreed in theory at any rate, that such museums should be local.

In Yorkshire we have admittedly a rich field around us, yet one must confess, with profound regret, that no adequate attempt has been made to deal with this wealth of material, either for the county as a whole, or for any portion of it.

Now that Botanical Survey and Ecology have given us a truer insight into the meaning and significance of natural and human history, especially the value of the study of the habitat in its fullest sense, the time has come when more determined efforts in this direction should be made.

A museum based on an intensive local survey of plant and animal, including human communities, would provide the best material for research, and yield the most profitable results for the community which maintains it. Such a museum would provide ample scope for the most skilful hands and the most able minds.

In this way ecological studies may extend to man, and the time may come when, with well directed and concentrated effort, we may be able to devise human habitations fit for men to live in, but as man, like the plant, is often the controlling agent in the habitat, may we hope the race will be fit for the environment.

*Page 18 of Handbook, line 15, for 10 read 100.

Our thanks are due to Mrs. Wager and the University of Leeds for permission to reproduce the portrait of Professor Miall, and to Mr. W. H. Sikes for photographs from which two of the blocks were made.

BIBLIOGRAPHY.

1. ADAMSON, R. S., "On the Relationships of some Associations of the Southern Pennines." *Journal of Ecology*, Vol. VI., June, 1918.
2. ATKINSON, J., "Sketch of the Geographical Distribution of Plants in Yorkshire." *Mem. Wernerian Nat. Hist. Socy.*, Vol. V. Edinburgh, 1824.
3. BAINES, HENRY, "The Flora of Yorkshire." Halifax, 1840.
4. BAKER, J. G., and NOWELL, JOHN, "A Supplement to Baines' Flora of Yorkshire." London, 1854.
5. — "North Yorkshire: Studies of its Botany, Geology, Climate, and Physical Geography." London, 1863, and *Trans. Y.N.U.*, 1888—1906. See also:—
6. — "Botany." Victoria County History: Yorkshire. Vol. I., pp. 111—172. 1907.
7. — "On the Present State of our Knowledge of the Geography of British Plants." *Naturalist*, April and May, 1883.
8. — "The Fathers of Yorkshire Botany." *Trans. Y.N.U.*, 1885 Series E.
9. BARRY, J. W., "Sylvan Vegetation of Fylingdales, N.E. Yorkshire." *Naturalist*, December, 1907.
10. BLACKMAN, F. F., "What is Botany"? *New Phytologist*, January and February, 1919.
11. BURRELL, W. H., "The Mosses and Liverworts of an Industrial City." *Naturalist*, April, 1917.
12. CARTER, W. L., "The Glaciation of the Don and Dearne Valleys." *Proc. Yorks. Geol. Socy.*, XV., 1905.
13. CROSSLAND, C., "The Distribution and Association of Mosses and Hepatics in the Parish of Halifax," *Halifax Naturalist*, October, 1903.
14. CROSSLAND, C., and NEEDHAM, J., "The Plants of Pecket Wood." *Naturalist*, June, 1904.
15. CRUMP, W. B., SMITH, W. G., and FORBES, W., "The Utilisation of Waterworks' Gathering Grounds by Afforestation." *Halifax Naturalist*, April, 1902.
16. — "The Flora of the Parish of Halifax." Halifax, 1904, and *Halifax Naturalist*, 1896—1904.
17. — "The Wilting of Moorland Plants." *Brit. Assn. Report*, 1911, p. 582.
18. — "The Water-Content of Acidic Peats." *Naturalist*, October, 1911.
19. — "The Co-efficient of Humidity: a new Method of Expressing the Soil Moisture." *New Phytologist*, April, 1913.

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20. ——— "Notes on the Water-Content and the Wilting Point." *Journal of Ecology*, Vol. I., 1913.
21. DAVIS, J. W., and LEES, F. A., "West Yorkshire : An Account of its Geology, Physical Geography, Climatology, and Botany." London, 1878.
22. ELGEE, FRANK, "Glacial Survivals." *Naturalist*, September, 1907.
23. ——— "The Vegetation of 'Swiddens' in North East Yorkshire." *Naturalist*, January, 1910.
24. ——— "The Moorlands of North-Eastern Yorkshire. Their Natural History and Origin." Hull, 1912.
25. GAUT, R. C., "Botanical Survey of a Pasture." *Naturalist*, April, 1904.
26. GULLIGAN, A., "Note on the Soil below the Peat on Moughton Fell." *Naturalist*, October, 1918.
27. HARDY, M., "A General Map of the Highlands with a Sketch of the History of the Methods." *Scott. Geogr. Mag.*, XXII., 1906.
28. HARRISON, J. W. HESLOP, "A Survey of the Lower Tees Marshes and of the Reclaimed Areas adjoining them." *Trans. Nat. Hist. Soc., Northumberland, Durham, and Newcastle-upon-Tyne*, New Ser., Vol. V., Pt. I., 1918.
29. JEFFERIES, T. A., "Ecology of the Purple Heath Grass (*Molinia cærulea*)" *Journal of Ecology*, Vol. III., June, 1915.
30. ——— "The Vegetative Anatomy of *Molinia cærulea*." *New Phytologist*, March and April, 1916.
31. JOHNSON, J. W. H., "Ecological Methods of Soil Analysis." *Naturalist*, June and December, 1913.
32. JOWETT, A., and MUFF, H. B., "Glacial Geology of Bradford and Keighley District." *Proc. Yorks. Geol. Soc.*, Vol. XV., 1905.
33. JOWETT, A., "The Glacial Geology of East Lancashire." *Quart. Journ. Geol. Soc.*, Vol. 70, 1914, pp. 199—231.
34. KENDALL, P. F., "A System of Glacier-Lakes of Cleveland." *Quart. Journ. Geol. Soc.*, August, 1902, and *Proc. Yorks. Geol. and Polytech. Soc.*, Vol. XV., 1903.
35. ——— *Victoria County History, Yorkshire (Geology)*. London, 1907.
36. KENDALL, C. E. Y., DEAN, J. DAVY, and RANKIN, W. M., "Geographical Distribution of Mollusca in South Lonsdale." *Naturalist*, September, October, November, December, 1909.
37. LEE, P. FOX, "Second Supplement to the Flora of Dewsbury and District." *Naturalist*, August, September, and October, 1912.
38. LEES, F. A., "The Flora of West Yorkshire with a Sketch of the Climatology and Lithology in connection therewith." London, 1888.
39. LEWIS, F. J., "Geographical Distribution of Vegetation of the Basins of the Rivers Eden, Tees, Wear and Tyne." *Geogr. Journ.*, XXIII and XXIV., 1904.

40. ——— "The Plant Remains in the Scottish Peat Mosses." *Trans. Roy. Soc.*, Edinburgh, 1905-6-7.
41. ——— "History of the Scottish Peat Mosses and their Relation to the Glacial Period." *Scott. Geogr. Mag.*, May, 1906.
42. LEWIS, H. C., "Glacial Geology of Great Britain and Ireland." London, 1894.
43. LISTER, MARY F. G., "One of our Blue Moor Grasses (*Molinia caerulea*, var. *depauperata*)." *Bradford Scientific Journal*, April, 1907.
44. LISTER, MARTIN, "An Ingenious Proposal for a new sort of Maps." *Phil. Trans.*, Vol. XIV., p. 739, 1683.
45. MARGERISON, S., "Report on the Afforestation of the Washburn Valley Estate." Leeds, September, 1905.
46. ——— "The Vegetation of some Disused Quarries." *Bradford Scientific Journal*. 1907—1909.
47. MASSEE, G., and CROSSLAND, C., "The Fungus Flora of Yorkshire. A complete account of the known Fungi of the County." *Trans. Y.N.U.*, 1902—1905.
48. MIALI, L. C., and CARRINGTON, B., "Flora of the West Riding." Bradford, 1862.
49. ——— "A Yorkshire Moor." *Nature*, Vol. 58, 1898.
50. MOSS, C. E., "The Life History of the Autumn Crocus." *Halifax Naturalist*, October, 1899.
51. ——— "On the Structure of Crocus Leaves." *Halifax Naturalist*. April, 1899.
52. ——— "Moors of South West Yorkshire." *Halifax Naturalist*, December, 1902.
53. ——— "Peat Moors of the Pennines: Their Age, Origin and Utilization." *Geogr. Journ.*, May, 1904.
54. ——— "The British Oaks." *Journ. of Bot.*, January & February, 1910.
55. ——— "The Fundamental Units of Vegetation." *New Phytologist*, Vol. IX., 1910.
56. ——— "The Vegetation of the Peak District." Cambridge, 1913.
57. MOSS, RANKIN, and TANSLEY, "The Woodlands of England." *New Phytologist*, Vol. IX., 1910.
58. PAWSON, A. H., "Water Plants as Land Winners." *Naturalist*, August, 1899.
59. PEACOCK, E. A. WOODRUFFE, "The Rock-Soil Method and *Ballota nigra*, Linn. in Lincolnshire." *Naturalist*, February, 1909.
60. ——— "The Ecology of Thorne Waste." *Naturalist*, September, November, December, 1920, and January, 1921.
61. PEARSALL, W. H., "Aquatic and Marsh Vegetation of Esthwaite Water," and "Classification of Aquatic Plant Communities." *Journal of Ecology*, Vol. VI., March, 1918.

62. ——— "The Aquatic Vegetation of the English Lakes." *Journal of Ecology*, Vol. VIII., 1920.
63. ——— "The Development of Vegetation in the English Lakes considered in relation to the General Evolution of Glacial Lakes and Rock Basins." *Proc. Roy. Soc., B.* Vol. 92, 1921.
64. ——— "A Suggestion of the Factors influencing the Distribution of Free-floating Vegetation." *Journal of Ecology*, Vol. IX., 1922.
65. ——— "Plant Distribution and Basic Ratios." *Naturalist*, August—September, 1922.
66. PETCH, T., "Statice Limonium on the North Bank of the Humber." *Naturalist*, January, March and April, 1922.
67. PHILLIPS, JOHN, Introduction to Baines' Flora of Yorkshire. London, 1840.
68. PRIESTLEY, J. H., "The Mechanism of Root Pressure." *New Phytologist*, July and October, 1920.
69. ——— "Suberin and Cutin," *New Phytologist*, March, 1921.
70. ——— "Further Observations upon the Mechanism of Root Pressure," *New Phytologist*, March, 1922.
71. PRIESTLEY, J. H. and EVERSLED, A. F. C. H., "Growth Studies. I.—A Quantative Study of the Growth of Roots." *Ann. Bot.*, April, 1922.
72. PRIESTLEY, J. H. and PEARSALL, W. H., "Growth Studies. II.—An Interpretation of some Growth Curves." *Ann. Bot.*, April, 1922.
73. PRIESTLEY, J. H. and HINCHLIFF, M., "The Physiological Anatomy of the Vascular Plants Characteristic of Peat." *Naturalist*. August, September, 1922.
74. PRIESTLEY, J. H., TUPPER-CAREY, R. M., and WOFFENDEN, L. M. "Physiological Studies in Plant Anatomy." *New Phytologist*, November and December, 1922.
75. RANKIN, W. MUNN, "The Peat Moors of Lonsdale." *Naturalist*, March and April, 1910.
76. REID, CLEMENT, "The Origin of the British Flora." London, 1899.
77. ——— "The Relation of the present Plant Population of the British Isles to the Glacial Period." *Naturalist*, November, 1911.
78. REID, CLEMENT, and REID, ELEANOR M., "On the pre-Glacial Flora of Britain." *Journ. Linn. Soc., Bot.* 38, 1908.
79. ROBINSON, J. F., "The Flora of the East Riding of Yorkshire, including a physiographical sketch," "to which is added a List of the Mosses of the Riding by J. J. MARSHALL," Hull, 1902.
80. ——— "Statice Limonium—Addendum." *Naturalist*, May, 1922.
81. SIMPSON, J. R., "The Moss Flora of Hagg Wood, near Huddersfield." *Naturalist*, July, 1921.
82. SMITH, ROBERT, "Plant Associations of the Tay Basin." *Proc. Perthshire Soc. Nat. Sci.*, Vol. II., Pt. VI., 1898, Vol. II., Pt. VI., 1898, Vol. III. Pt. II., 1900, and Vol. III. Pt. II., 1900.

83. ——— "On the Study of Plant Association." *Natural Science*, 1899.
84. ——— "Botanical Survey of Scotland: Edinburgh District." *Scott. Geogr. Mag.*, XVI., 1900.
85. ——— "Botanical Survey of Scotland: Northern Perthshire." *Scott. Geogr. Mag.*, XVI., 1900.
86. SMITH, W. G., "A Botanical Survey of Scotland." *Scott. Geogr. Mag.*, March, 1902.
87. ——— "Origin and Development of Heather Moorland." *Scott. Geogr. Mag.*, November, 1902.
88. ——— "Botanical Survey in Yorkshire." *Scott. Geogr. Mag.*, August 1903.
89. ——— "Botanical Survey for Local Naturalists' Societies." *Naturalist*, January, 1903.
90. SMITH, W. G. and MOSS, C. E., "Geographical Distribution of Vegetation in Yorkshire. Pt. I.—Leeds and Halifax District." *Geographical Journal*, April, 1903.
91. SMITH, W. G. and RANKIN, W. M., "Geographical Distribution of Vegetation in Yorkshire. Pt. II.—Harrogate and Skipton District." *Geographical Journal*, August, 1903.
92. SMITH, W. G., "Notes on the Vegetation of Ponds." *Naturalist*, October, 1903,
93. SMITH, R. and SMITH, W. G., "Botanical Survey of Scotland, III. and IV., Forfar and Fife." *Scott. Geogr. Mag.*, XX. and XXI., 1904-5.
94. SMITH, W. G., and WOODHEAD, T. W., "Botanical Survey of Teesdale." *Naturalist*, August, 1910.
95. SMITH, W. G., "Present Position of Botanical Survey in Britain." *Trans. Bot. Soc., Edinburgh*, Vol. 23, Pt. 2, 1912.
96. SMITH, W. G. and CRAMPTON, C. B., "Grassland in Britain." *Journ. Agri. Sci.*, 1914.
97. SMITH, W. G., "The Distribution of *Nardus stricta* in Relation to Peat." *Journal of Ecology*, Vol. 6, March, 1918.
98. TANSLEY, A. G., "Types of British Vegetation." Cambridge, 1911, and
99. ——— "The Classification of Vegetation and the Concept of Development." *Journal of Ecology*, Vol. VIII., June, 1920.
100. THOMAS, H. HAMSHAW, "The Fossil Flora of the Cleveland District of Yorkshire." *Quart. Journ. Geol. Socy.*, Vol. LXIX., 1913. See also *Proc. Cambridge Phil. Soc.*, 1911-12-13-15 and 22., *Phil. Trans. Roy. Soc.*, series B. 337, 1915, and *Naturalist*, Jan. 1915.
101. THURMAN, J. "Essai de phytostatique appliquée à la chaîne du Jura et aux contrées voisines." Berne, 1849.
102. WATSON, H. C., "Observations on the Construction of Maps for illustrating the Distribution of Plants." *Mag. Nat. His.*, 1836.
103. ——— "Geographical Distribution of British Plants." London, 1843.

128 *Woodhead: Botanical Survey and Ecology in Yorkshire.*

- 104. — “Cybele Britannica.” 4 vols., 1847—1851.
- 105. — “Compendium of the Cybele Britannica.” 3 Parts and Supplement, 1868—1872.
- 106. WATTAM, W. E. L., “Buckton Marsh, East Yorkshire.” *Naturalist*, October, 1912.
- 107. WEST, W. and WEST, G. S., “The Alga-Flora of Yorkshire. A complete account of the known Freshwater Algæ of the County, with many notes on their affinities and distribution.” *Trans. Y.N.U.*, 1900—1901.
- 108. WILLIS, J. C., “Evolution of Species in Ceylon.” *Annals of Botany*, January, 1916.
- 109. — “Age and Area.” Cambridge, 1922.
- 110. WOODHEAD, T. W., “Remarks on the Huddersfield Flora.” *Rep. Hudd. Nat. and Photo. Socy.*, 1893.
- 111. — “The Bilberry. *Vaccinium Myrtillus*!” *Halifax Naturalist*, December, 1899.
- 112. — “Notes on the Bluebell.” *Naturalist*, February and March, 1904.
- 113. — “Ecology of Woodland Plants in the Neighbourhood of Huddersfield.” *Journ. Linn. Soc. Bot.* 37, 1906.
- 114. — “Classification of Alien Plants according to Origin.” *Naturalist*, April, 1906.
- 115. — “The Flowering Rush. *Butomus umbellatus*.” *Lebensgeschichte der Blütenpflanzen Mitteleuropas*, Stuttgart, 1906.
- 116. — “Notes on the Botany of Cautley and Tebay.” *Naturalist*, September, 1912.
- 117. — “Plant Associations of Flamborough Head.” *Naturalist*, July, 1912.
- 117a. — “The Study of Plants.” Oxford, 1915.
- 118. — “Scheme for the Development of a Local Museum.” Huddersfield, 1919 and 1921.
- 119. — “Occurrence of Boulder Clay in the Neighbourhood of Huddersfield.” *Naturalist*, July, 1917.
- 120. Yorkshire Naturalist Union Handbook, *Brit. Assn.*, Hull, 1922.

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RILEY FORTUNE, F.Z.S.

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NOTES AND COMMENTS.

ANCIENT MAN IN BRITAIN.*

To the enormous quantity of literature dealing with Early Man in Britain, a substantial volume has now been added by Mr. Mackenzie. We must admit, however, that he deals with the matter in a rather different manner from that usually adopted. He seems to handle his subject with a little more power than usual, and we get such chapters as 'The Age of the Red Man of Wales'; 'Shell Deities and Early Trade'; 'The Faithful Dog'; 'Ancient Mariners Reach Britain'; 'Neolithic Trade and Industries'; 'The Lore of Charms'; 'Why Trees and Wells were Worshipped'; and 'Ancient Pagan Deities'; and many of these are quite fascinating. In the index we miss many well known names of workers whose books we should have thought the author would have consulted and referred to. He has much to say about the Maglemose, but he seems to have been spared the misfortune of including the Holderness Harpoons in his work. The cover is decorated by a representation of one of the curious chalk objects found by Canon Greenwell in a Yorkshire Barrow. This is figured among his Religious Objects, and is described as with ornamentation showing butterfly and St. Andrew's Cross symbols. Our efforts to find reference to this object in the index, which otherwise seems particularly complete, have been unsuccessful.

COAL.

The Sheffield University has issued a series of lectures on Coal and its Utilisation (published by the Colliery Guardian Co., Ltd., 41 pp., 5s.). The lectures published are as under:— 'The Constitution of Coal,' by Marie C. Stopes; 'The Preparation of Coal for the Market,' by F. S. Sinnatt; 'The Carbonisation of Coal,' by R. Lessing; 'The Purification of Coal Gas,' by H. Chamberlain; 'Ammonia from Coal,' by J. W. Cobb. It is useful to get these lectures printed, but the large size of the pages, the paper cover, and the thinness of the pamphlet, make it very difficult to keep handy for reference, and five shillings for 41 pages seems sufficient.

OVIPOSITION OF *COLIAS EDUSA*.

At a recent meeting of the Linnean Society, Mr. F. H. Lancum stated: 'In early September of last year I had seven captured female specimens of *Colias edusa*, which I kept for the purpose of obtaining ova. Of these, six duly deposited ova in fair numbers. I had the seventh in confinement for a fortnight without result, the insect steadfastly refusing to lay, although I was convinced that it was fertile. As it also

* By Donald A. Mackenzie. London: Blackie & Son, xv.+257 pp., 12/6 net.

declined to feed, I had recourse to the usual practice in refractory cases of holding the insect by the wings, running out its proboscis on a fine needle, and allowing the end of the organ to rest on a pad of cotton wool which had previously been soaked in sugar water. Frequent repetition of this had the effect of rendering the insect quite tame. On the fifteenth day I was demonstrating this fact to a friend by introducing the tip of a finger, to which the insect would immediately cling. After one such occurrence I transferred the insect to a leaf of a potted plant of white clover, when to my surprise it laid an egg. I allowed it to remain for some minutes, and, as nothing further happened, I decided to repeat the experiment. I transferred the insect to another leaf of the same plant, and it again obliged. To cut the story short, I moved it seventeen times and obtained seventeen eggs, after which it refused to lay. So far as I am aware, this butterfly had not previously laid an egg, and never afterwards laid another. It died the following day.'

MORE OIL.

Another important discovery of oil in England is announced, this time, we are sorry to say, in Yorkshire. The journalistic importance of the find may be judged from the following headings and sub-headings in a Yorkshire newspaper :— 'Oil Deposits in Ryedale ; Discovery on a Farm at Sinnington ; What Tests of Shale Drift have yielded ; Prospect of Commercial By-products ; Rich in Mineral Wealth ; Results of Tests ; How the Discovery was made ; Well kept secret.'

RYEDALE DOOMED (?).

We may, perhaps, quote the first paragraph of this article :— 'What is believed to be the fringe of a rich oilfield has been discovered at Manor Farm, Sinnington, near Pickering. Boring has not yet been commenced, but a test analysis shows that each ton of surface shale yields an average of 30 gallons of oil. It is understood that further investigations are to be continued, and there is every prospect of a wealthy industry being opened up in the Sinnington district. The land on which the oil has been located is owned and farmed by Mr. Henry Potter, one of the most influential members of the North Riding Executive (No. 2) of the National Farmers' Union. The extraction is of exceptionally high quality, with every prospect of commercial by-products, there being, according to the first analysis, a low percentage of sulphur and a clearly defined admixture of sulphate of ammonia. Of course, some time must necessarily elapse before the oil find can be developed to any appreciable extent, but the London and North Eastern Railway has excellent station and siding accommodation, and Sinnington is not too far removed from the great industrial

centres of the North and West Ridings to allow of channels being opened up which would greatly facilitate transport. Sinnington is in the heart of the right district, and the whole countryside is eagerly awaiting the opening out of an industry which is bound to create a good deal of employment and to enrich the countryside.'

MINERAL WEALTH.

After referring to Yorkshire's mineral wealth of lime, chalk, jet (!), 'rare silicas,' etc., the article proceeds:—'But a discovery which may well startle the great industrial leaders of this country, and which, if the first promise afforded by preliminary tests is fulfilled, may yield results of such a character as to change the whole face of the pretty countryside to be found around Pickering and Ryedale. Oil deposits have been found in the neighbourhood of that picturesque bit of country lying between Sinnington, Appleton-le-Moors and Kirbymoorside. . . . Whether the discovery at Marton Head will prove of greater value than those of Chesterfield, Wales, or Scotland remains to be seen. But it is beyond question or doubt that oil has been found on the Manor Farm. Experts have confirmed the reality of this, and preliminary testings of the shale drifts have yielded a decidedly higher percentage of oil than any of the discoveries of recent years. Samples of the surface shale have been submitted for analysis and test, and the percentage of oil found is in the proportion of 30 gallons per ton of shale.'

A CRUSTACEAN COMBUSTION !

'The manner in which the discovery was made was really romantic. Two old friends—one the owner of the property—were strolling over the rich meadows which abut upon the little stream known as Catter Beck, which has its source in the moors above the lovely moorland village of Hutton-le-Hole, and then sinks in the gravel on Appleton Common to come to the surface again on the Manor Farm, Sinnington, when the owner's attention was drawn to a remarkable deposit of clay, almost brick-red in colour, and which, on being handled, was found to be hard. Further on, a peculiar black ooze was noticed. In the vicinity *were unmistakable geological signs of a big crustacean combustion, which left several miniature craters*, and in the hollows of these are to be found some of the most important foxholes in the whole of the Sinnington country. Both gentlemen were struck by the unusual colour, formation, and composition of the outcrops. Further investigation led to the discovery of a similar kind of strata near the banks of the beck, eighty feet below the top of the mound-like hills on which the first outcrop was found. For a distance of about fifty yards the little stream flows over this bed of black ooze,

which bears unmistakable signs of oil. In the hillside are to be found other big drifts of the black stratum, and altogether the surface evidences point to a rich deposit of oil. The 'prospectors' immediately took steps to make preliminary testings. 'Improved retorts' were made, and from the very first it was proved that the ooze contained 'combustive gases' and all the other signs of mineral oil. The appliances used were altogether insufficient to give a completely satisfactory testing. They did indeed yield several rather 'startling explosions,' which only helped to confirm the first 'speculative estimates' of the discoverers. With the natural and instinctive reticence of the ordinary Yorkshire farmer, who is afraid to proclaim a discovery for fear it may prove a mild disappointment, the whole secret has been kept quiet. Although the aid of geological and engineering experts has been obtained, and their preliminary findings amply confirm the claim to have discovered oil on the Manor Farm, no information has been allowed to leak out to the public.'

THE PLAIN FACT.

The plain fact is, of course, that once again the traces of oil which occur in the Oolite clays, which exist in many parts, have misled somebody—including the journalist. We have no fear of Ryedale losing its charms as a result of these 'prospectors.' It would be interesting to know how the estimate of thirty gallons to the ton was arrived at, and who are the geological and engineering 'experts' who 'amply confirm' the reports. Thousands of pounds have been wasted in the search for oil in the Secondary shales in this country, and we hope Mr. Potter will not add to this waste. Perhaps he wants to sell his farm!

FOR SCIENCE.

Sir Alfred Yarrow has recently presented £100,000 to the Royal Society, and in the covering letter he states, 'I should like to record my firm conviction that a patriotic citizen cannot give money, or leave it at his death, to better advantage than towards the development of science, upon which the industrial success of the country so largely depends.' In the same number of *Nature* in which his letter is printed, we gather that it is likely, for 'economical' reasons, that the income of the British Museum, including the Natural History Department, is to be curtailed to the extent of several thousands of pounds per annum. As *Nature* truly says: 'To choke one of the great fountains of "learning and useful knowledge" can never be an economical proceeding, and any attempt to do so will meet with the united protest of all scientific workers.'

EARLY MAN AGAIN.

We are glad to see that *Nature* is joining in the protest against the publication of exaggerated reports of discoveries of early man, as will be seen from the following two paragraphs taken from a recent issue :—‘ Telegrams from New York appeared in several newspapers of February 28th, announcing the discovery of a fossilised human skull in the province of Santa Cruz, Patagonia. The *Times* of March 1st published particulars relating to the skull, which were obtained by its correspondent at Buenos Ayres from the discoverer, Dr. Wolf, formerly of the Canadian Geological Survey. The skull, it appears, was found not by Dr. Wolf, but by a settler seven years ago in sand-hills in the pampas lying some twenty miles to the west of the port of Santa Cruz. The discoverer reports it to be “ petrified ” and “ probably of tertiary origin.” As regards its characters, all that is to be learned is that it is “ long in proportion to its width,” that its “ frontal eminences are well marked,” and that it may be a woman’s skull. It is true that there exist in Patagonia deposits of the right age to yield fossil remains of Pliocene man, and on numerous occasions, during the past twenty-five years, claims of his discovery have been made. None has stood the test of inquiry ; when the remains proved to be human, it was found that a mistake had been made concerning their geological antiquity ; when their antiquity was upheld, the remains proved not to be human. Whether the discovery now announced will prove an exception remains to be seen.’

A JERSEY EXAMPLE.

‘ A well-preserved dolmen has been discovered by workmen while excavating at the back of a house at St. Ouens, Jersey. Associated with the dolmen was a kitchen midden full of limpet shells and containing an ancient human skull and a round stone for grinding corn. The skull is very much flattened in the frontal region, and it is no doubt on this ground that a very high antiquity, exceeding that of *Pithecanthropus erectus*, has been attributed to it locally, as is stated in a highly coloured report which appeared in the *Daily Mail* of February 26th. It is also suggested that the kitchen midden is of mesolithic age. Although the find is of considerable interest, neither supposition appears to be well founded. Shell-fish must always have been, as they are still, an important element in the diet of the islanders, and therefore does not necessarily indicate a mesolithic culture, while the association with the dolmen and a stone for grinding corn would suggest that a very early date in the neolithic period for the skull is not probable. The flattened appear-

ance of the skull, upon which stress is laid in the report of the discovery, may be due to pathological causes, but more probably is, as often happens, a case of flattening due to post-mortem pressure after burial. Further details of the measurements of the skull will be awaited with interest, as it will be important to note whether, notwithstanding its distortion, it is to be ascribed to the Mediterranean long-headed type.'

WORDS.

We take the following from an article on The Lady Lever Art Gallery, appearing in the usually prosaic *Museums Journal* :—' Viscount Leverhulme, in forming his collections, seems to have aimed at gathering great works of art in painting, sculpture, furniture, tapestries, etc., for their individual qualities without special regard to sequence of period, school, or nation ; and endeavoured to secure what was good, rare and beautiful according to the taste and judgment of the time, avoiding the experimental, the bizarre, or the clever diverse forms of art expression, the outcome of the lofty aspirations through revolutionary methods of the painters of the present day. Time and culture had already proved the genuine art value of his selection. The scale on which it has been made, and the high quality of the examples, could only be possible to almost unlimited wealth. It is the collection of a private individual of the highest eminence in the business world ; who, with keen business acumen and wise discernment, recognised that the scheme he evolved belonged to a special region of knowledge outside that of business, and he has obviously called to his aid the best qualified connoisseurs in the subjects it involved. The result is the loftiest expression of Art : plastic, painting, and applied.

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R. S. Bagnall describes some new British Thysanoptera in *The Entomologist's Monthly Magazine* for March.

F. Littlewood writes on ' Autumnal Forcing of Larvæ of *Macrothylacia (Bombyx) rubi* ' in *The Entomologist* for February.

C. B. Moffat has a paper on ' The Study of Common Wild Flowers : a plea for closer investigation,' in *The Irish Naturalist* for March.

Dr. A. Roman, of Stockholm, describes ' Three new English Ichneumonids ' in *The Entomologist's Monthly Magazine* for February.

' A Century of Zoology in Edinburgh,' by W. C. M'Intosh, and ' Migration in the Sea,' appear in *The Scottish Naturalist* for January.

In *The Entomologist's Record* for February is a detailed account of the various prices of British Lepidoptera realised at the Horne Sale recently.

Extraordinary results of the British Birds Marking Scheme are given in *British Birds* for February, by A. L. Thomson and H. F. Witherby.

The Irish Naturalist for February is almost entirely occupied by an account of ' A Fortnight's Entomology in Co. Waterford,' by O. J. Janson and L. H. B. Wyse.

SHEEP AND EARLY MAN IN BRITAIN.*

H. E. FORREST.

THE antiquity of the sheep in Britain has rarely been discussed. Its importance can hardly be exaggerated. A people which possessed domestic sheep would be a pastoral race: they would spin and weave the wool and clothe themselves in the cloth. A people which had no sheep would live by hunting and clothe themselves in skins. Under which of these heads are the Neolithic people of Britain to be classed?

As a rule, archaeologists—especially if they are not also zoologists—seem to assume that the Neoliths had both flocks and herds. The Rev. P. H. Ditchfield, in a book, ‘Old Village Life,’ published 1920, refers twice on one page to the ‘cows and sheep’ of the Neoliths.

The object of this paper is not so much to deny that the Neoliths had sheep and oxen, as to sift the evidence for and against the fact; and to elicit further evidence.

One of the difficulties to be contended with is that when it comes to identifying remains in caves, etc., it is extremely difficult to distinguish the bones of sheep from those of the goat. All that can be said—except in the case of feet and skulls—is that when these are present in quantity they are most likely those of sheep.

The question really resolves itself into this:—Have remains of sheep ever been found in Britain in direct and indisputable association with those of Neolithic man?

So far as I have been able to ascertain there is not a single instance of such alleged association that is not open to doubt.

Now sheep are mainly kept in open grass lands, and their remains should occur in such situations. But for the purposes of this enquiry the finding of sheep-remains in open country, even at some depth, is of no value as evidence, because they may have been carried down by burrowing animals such as the rabbit or fox, or may have died and been buried by early farmers. The most reliable evidence is that derived from cave-deposits. Most accessible caves were used by early man as shelters, and into these he carried animals for food. If he had sheep, we should expect to find in caves traces of his feasting, associated with implements and other relics.

The following is a summary of the evidence afforded by caves :—

KENT’S CAVERN, Devonshire. Sheep remains occur in upper deposits only, which are of Romano-British date.

VICTORIA CAVE, Settle, Yorks. Of Neolithic Age, contained no remains of sheep.

* Read before the Vertebrate Zoology Section of the Yorkshire Naturalists’ Union, Feb. 1923.

KIRKLAND CAVE, Cartmel, Morecambe Bay, of Romano-British date, as well as

POOLE'S CAVERN, Buxton, and

KENDRICK'S CAVE, Llandudno, of similar date, all three yielded bones of sheep.

YORKSHIRE AND DERBYSHIRE BARROWS have contained sheep remains only in those of the Bronze Age.

CRESSWELL CAVES, Derbyshire, had deposits of two periods, but sheep occurred only in the upper, prehistoric layers.

RAINS CAVE, Longcliffe, Derbyshire, yielded remains of both *Bos primigenius* and *longifrons*—the wild and domestic ox, with sheep, pig, dog, and recent wild animals. It also is prehistoric.

DEEPDALE CAVE and

HAREBOROUGH CAVE, Derbyshire, both Romano-British, contained sheep.

HOE GRANGE CAVE, Longcliffe, is remarkable as the only cave in Britain where remains of fallow deer have been found. Its fauna is Pleistocene, and it contained no sheep.

UPHILL CAVE, in the Mendips, inhabited in historic times, contained many bones of sheep. A fissure in the roof, blocked by two large masses of limestone, contained numerous Pleistocene animals. Had these blocks fallen down subsequently we should have had the anomaly of remains of Pleistocene animals deposited above those of later date.

Longberry Bank Cave, Penally, Pembrokeshire, contained remains of ox, sheep and dog associated with Roman pottery.

LLANDEGLA CAVES, Denbighshire. A group of small caves, had in some instances been used as burial places in Neolithic times. Remains of sheep, ox, dog, pig and horse were found in the more recent deposits, but in no case actually associated with human interments.

PLAS HEATON CAVE, Denbighshire, showed signs of human habitation at two periods. The upper deposits contained sheep, ox, dog, etc. ; the lower remains of Pleistocene animals, including the Glutton.

CEEN CAVES, St. Asaph, were similar, but little care was taken at first in distinguishing horizons, so that the evidence is unreliable.

THE GOP CAVE, Prestatyn. A full account of this cave is given by Professor Boyd Dawkins in *Archæologia Cambrensis*, 1902, 175. It showed evidences of human occupation through a long period, and had been used both as a shelter and burial place. A sepulchral chamber contained remains of twelve long-headed, and two round-headed people. Articles found with them show that they belonged to the Bronze Age. In the upper strata were remains of horse, ox, sheep, pig and

recent wild animals. Further researches, conducted by Mr. J. H. Morris in 1912, led to the discovery of a continuation of the Gop Cave in the form of a low tunnel from which other passages branched. Pleistocene animals found therein were the bison, bear and lynx — the latter very rare in Britain. The long-headed people interred here are regarded by Professor Dawkins as 'Iberians' (*i.e.*, Neoliths), but other evidence shows that although they were of Neolithic ancestry, they actually lived in the Bronze Age. Sheep were found only in the more recent deposits.

In an elaborate paper on 'Domestic Sheep and their Wild Ancestors,' published in 1914, Professor Cossar Ewart draws the conclusion that three Old World kinds of sheep—the Argali, Urial, and Mouflon—have taken part in the formation of our domestic breeds. No indigenous wild sheep is known to have inhabited Western Europe, and it seems fairly certain that our domestic sheep are mainly, if not entirely, of Asiatic origin. Much has been made of a so-called species, *Ovis savinii*, found in early Quaternary beds in Lincolnshire. It appears to have been founded on a solitary specimen in the British Museum which Dr. A. S. Woodward was kind enough to show me. It is a left horn-core with small portion of skull attached. I see that it is now labelled *Caprovis savinii*, and to my unsophisticated eye it is much more *goat* than sheep. In any case, between the period when this animal lived, and the Neolithic Age, according to Professor Cossar Ewart:—
'For thousands of years there were neither wild nor tame sheep in Britain,' and although when the climate improved later 'Sheep might have reached Britain with the reindeer (and . . . at and above Windsor, where many of the migrating herds lost their lives crossing the Thames, reindeer bones are numerous) . . . not a single sheep bone has yet been found. Reindeer hunters who followed in the wake of the retreating reindeer had neither sheep nor any other domestic animals In course of time a mixed race of men reached Britain, consisting of both long-headed and round-headed individuals The later bands, in which round-headed individuals preponderated, had polished stone implements; had acquired some skill in weaving and making pottery; and they brought with them the turbarry sheep; the small Celtic shorthorn ox; the pig, goat, and dog. . . . Some centuries later a nearly pure round-headed race reached the south of England, who possessed bronze, as well as stone implements. This race, which had horses as well as cattle, pigs, goats, and dogs, had, in addition to turbarry sheep, four-horned sheep, and sheep which measured 30 inches at the shoulders, with horns and cannon bones like those of the small wild 'ammon.' If the sheep bones from the alluvium of the Thames

Valley belong, as I believe, to sheep in part descended from a small variety of 'ammon,' it follows that, even before the coming of the Romans, Britain had sheep which included the Argali, as well as the Urial and Mouflon, amongst their ancestors.'

In connection with the above extracts, I also had a letter from Professor Ewart, in which he says:—'If you can find from geologists the age of the Lea Alluvium you will be in a position roughly to estimate when sheep reached the south of England—it was certainly centuries before the coming of the Romans.'

I wrote to the Geological Museum, Jermyn Street, on this point, and had a reply from Mr. E. T. Newton, F.R.S. He writes:—'I am sorry not to be able to say anything definite about the Thames or Lea Valley Alluvium. Its age is quite uncertain. Historically it may be old, but it may also be quite recent. Moreover, there is always the possibility of recent things being mixed with more ancient remains.'

In another letter replying on the whole question 'as to the presence of sheep in Britain,' he says, 'There is no authentic record of its being in this country in Pleistocene times; such notices as have been published in times gone by are not now accepted as evidence for its presence in Pleistocene deposits in this country. Such specimens as have been found even in caves are not to be accepted as of any great age. It is very doubtful if the sheep has ever been found in this country under conditions which would justify its being regarded as of Neolithic Age. On the continent of Europe, however, the sheep is met with in lake-dwelling deposits.'

Much confusion has been caused by archaeologists supposing that each succeeding race that invaded England drove out its predecessor. For instance, that the round-headed Goidels drove out the long-headed Neoliths. This was only partially true. In the west of England, especially, the Neoliths were in the majority for a long time after the Goidels came. The two races subsisted side by side, with but little fusion. They even shared a common grave. Hence the Goidels and Neoliths buried in the Gop Cavern were actual contemporaries—not successive inhabitants of the district. The long-headed men buried here were of Neolithic ancestry; but actually lived in the Bronze Age.

Professor Cossar Ewart, in the passage quoted, speaks of 'a mixed race, consisting of both long-headed and round-headed individuals, reaching Britain,' adding that they brought with them sheep and oxen, and had pigs, goats, and dogs. I venture to suggest that Professor Ewart is mistaken in supposing that the new-comers were a mixed race; they were round-headed Goidels; they mixed with the earlier

inhabitants—the long-headed Neoliths—*after* settling in Britain. If we accept this explanation, much that is obscure in the remainder of Professor Ewart's paper becomes clear; whilst it throws a flood of light on the confusion in which the whole subject has been involved by the earlier archaeologists.

The conclusions drawn seem to be as follows:—

(1) There were no domestic sheep in Britain in Pleistocene (=Palæolithic) times.

(2) Nor in Neolithic times—using the term 'Neolithic' in the strict sense.

(3) Domestic sheep were introduced into Britain some time in the Bronze Age, probably by the Goidels.

Later there was an influx of another round-headed race—the Brythons. All three races—Neoliths, Goidels and Brythons—were here before the Roman invasion. Long before that they had become agriculturists, with large flocks of sheep and herds of small short-horn cattle, as well as goats, dogs and horses. They spun and wove both wool and linen, fastening their garments with bronze brooches or bone pins. Cloth made of British wool was known and highly esteemed by the Romans before they invaded England.

From a study of the Romano-British remains at Uriconium and other Roman stations in Shropshire, I have come to the conclusion that the iron implements, etc., possessed by the Britons, were obtained from the Continent. The Britons did not know how to extract iron from the ore until the Romans showed them how to do it. The Britons were using bronze implements up to the time of the Roman invasion. They had few of iron, although the period is known as the Iron Age.

There is some evidence that the later Neoliths had the small Celtic shorthorn (*Bos longifrons*). It would be natural for them to domesticate the ox before the sheep, because the genus *Bos* is indigenous whilst *Ovis* is not.

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GEOLOGY.

New Exposure of Permian Yellow Sands in Yorkshire.—In Kirkfield Lane, Thorner, as a result of erosion by farm vehicles, the yellow sands underlying the Magnesian Limestone have recently been exposed. There is no previous record of these beds along the escarpment between Garforth and Scriven. They are of the usual bright yellow colour, incoherent and contain no mica, but are somewhat finer than those in the neighbouring exposure at Garforth.—H. C. VERSEY.

MORE NORTH-COUNTRY HYMENOPTERA.

GEO. B. WALSH, B.Sc.

THE following are new records for localities or species, all, with the exception of the Braconid (named by Mr. G. T. Lyle), either named or confirmed by Mr. Claude Morley.

PROCTOTRYPIDÆ.—*Proctotrypes fuscipes* Hal., in moss on Hay Brow, near Scalby, 2/xii./1922; *Aclista striata* Kief., 2/xii./1922; *Spilomicrus rufitarsis* Kief., 2/xii./1922 (apparently rare); *Paramesius belytoides* Marsh., sweeping in Raincliffe Woods, 18/v./1922; *Basalys fumipennis* Westw., sweeping in Forge Valley, 2/viii./1922; *Loxotropa pedestris* Kief., by searching at the roots of vegetation on the sandhills at Spurn, 3/viii./1919; *Platymischus dilatatus* Westw., Ayr, 29/vii./1906, ex. coll. R. S. Bagnall; *Conostigmus cursitans* Nees, in cut grass, Scalby, 28/vi./1919; *C. lucidus* Kief., in mole's nest, Raincliffe Woods, 27/i./1923; *C. brachypterus* Thoms., ditto, 27/i./1923; *Lagynodes pallidus* Bohm., in nest of *Formica rufa*, Harwood Dale, 7/iv./1922; and commonly in flood refuse, Sherburn, 3/iii./1923.

CYNIPIDÆ.—A single specimen, taken under shore rubbish at Scalby Mills, 17/vii./1919, Mr. Morley refers to somewhat doubtfully to the inadequately described *Figites subapterus* Walk. (*Ent. Mag.*, ii., p. 117). The same species has been taken by Mr. J. H. Keys at Plymouth in company with *Aëpus*.

ICHNEUMONIDÆ.—*Microcryptus nigrocinctus* Grav., by sweeping, Chopwell Woods, near Newcastle-on-Tyne, 20/v./1916; *Phygadenon variabilis* Grav., in cut grass, Scarborough, 25/vi./1919; *Pezomachus rufipes* Först., in moss, Dipton Woods, near Corbridge, 28/x./1918; *P. festinans* Grav., in cut grass, Scarborough, 25/vi./1919; *P. fasciatus* Fab., in cut grass, Middleton-in-Teesdale, co. Durham, viii./1918; *P. carnifex* Först., sweeping, Forge Valley, 24/iv./1919; *P. attentus* Först., in cut grass, Great Corby, near Carlisle, 5/viii./1915, and by sweeping, Hayburn Wyke, 27/v./1919; *P. pulicarius* Fabr., by sweeping near the 'Falcon' above Cloughton, 10/ix./1922, and at the roots of sandhill-plants, Spurn, 2-4/viii./1919.

BRACONIDÆ.—*Blacus maculipes*, in stack refuse, Seamer Moor, 4/i./1923.

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From Mr. S. Hurst Seager we have received an admirably illustrated work dealing with 'The Lighting of Picture Galleries and Museums,' a subject he dealt with at a recent meeting of the Museums Association. All who are interested in this matter should consult Mr. Seager's paper, which originally appeared in the *Royal Institute of British Architects Journal* of January 13th. Some of his illustrations, taken from modern galleries, are rather startling.

BRONZE-AGE MOULD FOR CASTING PALSTAVES.

T. SHEPPARD, M.Sc., F.G.S.

PLATE I.

IN the *Transactions of the Hull Scientific and Field Naturalists' Club* for the year 1900 (Vol. I., No. 3, page 120), I had the privilege of figuring and describing a bronze mould for casting plain palstaves, which had been found at Hotham in 1867. This was then in the possession of the late Canon Greenwell, and was subsequently purchased, with the remainder of his collection, and presented to the British Museum, where it now is.

More recently the authorities at that institution have permitted me to have coloured casts of this mould, which are on exhibition with our collection of bronzes at Hull.*

When on the premises of a well-known London dealer recently, I was shown the valves of a very similar mould, slightly larger in size, for casting looped palstaves. The general resemblance of this example to the Hotham mould was very striking, and eventually I was able to secure this rare specimen for our collection. On comparing the present illustration with that in the *Transactions* referred to (see also Evans' *Ancient Bronze Implements of Great Britain*, p. 439, where the same mould is figured), it will be seen that the resemblance is remarkable, the present mould only varying in measurement by about quarter of an inch, due largely to the fact that a loop has been inserted on one side.

It is noticeable that, as with the Hotham example, one half of the mould has five studs (two on each side and one on the bottom), which correspond with five depressions on the other half, which enables the valves to be firmly fixed together while the cast is being made. In both there is a large cup-like receptacle for the bronze to be poured in, and on the outer side of the mould is a depression between the wings of the axe, though the recent example does not contain the medial ridge which occurs on the Hotham mould.

The two valves are practically identical as regards measurement, being $8\frac{1}{8}$ ins. in length, $2\frac{1}{4}$ ins. wide at the centre, $3\frac{5}{8}$ ins. wide at the bottom. The cup for the molten metal is $1\frac{1}{4}$ ins. deep, and when placed together exhibit a slit nearly an inch wide and nearly $\frac{1}{4}$ in. across.

The axe itself, when cast, measures $6\frac{3}{8}$ ins. in length, $2\frac{5}{8}$ ins. across the cutting edge. There is a very pronounced medial ridge on each side, surmounted by a bracket-like

* See *The Naturalist*, July, 1921, p. 231, and *Hull Museum Publication*, No. 128.

ornament which finishes at the stop for the handle. The wings measure 1 in. across. Jointly the two moulds (Nos. 103 and 103a) weigh 3 lb. 3 ozs., each one being practically half that weight.

The dealer thought the moulds had been found in South London, or at any rate that they were said to have been purchased from that locality, but I must admit they more resemble the type found in the North of England, especially judging from the nature of the axes which it would make. We have made one (No. 103b) in wax, which is illustrated on Plate I.

Bronze moulds for palstaves seem to be exceedingly scarce in this country, and, indeed, anywhere. Besides the two examples already referred to, a similar mould from Bangor is figured in *The Archaeological Journal*, Vol. VI., 1849, page 386, and is now in the British Museum. It is for an axe rather wider in the blade and narrower in the shank than the Hotham example. There are two projecting studs only; there is a depression on the upper part of the outside, and three rough triangular ridges decorate the lower portion:

Wiltshire has produced a particularly interesting example, which is also now in the British Museum, and has upon it a cast from the actual twine which had been upon the mould before the bronze casting was made. Respecting this, Evans states 'the bands on the two halves do not coincide, being on the one placed higher than the other. The sides are also joggled together in a singular manner. As to the bands of cording, it may be that the model of the first half of the mould was formed of clay, which when dry, in order to prevent its being broken, was tied on to the palstaves on which it had been shaped, and was thus moulded in clay or loam; and that afterwards, when the second half of the mould had to be cast by a similar process, the model for it was tied on to the half-mould already formed, the binding being in contact with the side of the band already in relief upon the back and sides of the half-mould.'

In *The Archaeological Journal*, Vol. XVIII., 1861, Mr. Albert Wray gives a list of various moulds for casting bronze axes, in which he mentions the fact that a mould was found near Norwich, and is figured in the *Transactions of the Norwich Mus. Cat.*, page xxvi. This, however, is for casting socketed celts.

A stone mould for looped palstaves is figured in *The Archaeological Journal*, Vol. IV, 1847, Plate IV., and another mould for plain palstaves on Plate V. of the same publication. These are in the Museum of the Royal Irish Academy.

BRONZE-AGE WEAPONS.

T. SHEPPARD, M.SC., F.G.S.

PLATE II.

SINCE the article containing particulars of additions to the Hull Collection appeared in *The Naturalist* for March, 1921, further valuable additions have been made to our collection of bronzes. The first, No. 104, is an early type of axe found near Scarborough, and resembles other bronzes found in this district, particularly the Gransmore Axe, No. 28, of our collection (fig. 1), and the Burstwick specimen, No. 29, fig. 2. The present example came from near Scarborough, and according to the label was bought in Wakefield in October, 1908. It is hammered laterally, causing shallow grooves, there is a slight ridge about half way down forming a stop; the cutting edge is well hammered out, though very slightly broken at one end. A feature of the axe, however, is the way in which the sides have been hammered into a cable-pattern or ripple-mark, the ridges extending from the left down to the right, as the axe is held in the hand with the cutting edge downwards. This feature is well illustrated on an example figured in 'A Guide to the Antiquities of the Bronze Age,' issued by the British Museum, second edition, page 59; also in figs. 24 (Perth) and 25 (Applegarth) in Evans' work. In our case the weathering has partly obliterated the pattern on one side, but it is quite clear and distinct on the other.

The axe measures $5\frac{5}{8}$ ins. in length, $1\frac{3}{8}$ ins. across the middle, the cutting edge is $3\frac{3}{4}$ ins. long and would have been 4 ins. if complete, the sides are hammered out to a width of $\frac{7}{8}$ in., and the specimen weighs $14\frac{1}{2}$ ozs. (Fig 3).

The Gransmore axe (No. 28) already referred to, has the edges hammered into three longitudinal faces, but without any trace of the cable pattern, whereas the Burstwick axe, though retaining these three ridges, also shows the cable pattern, though not so distinctly. In this case the ridges slope from right to left.

Two of the palstaves formerly in the possession of the late William Hewett of York, and collected by him in the East Riding, are also now in our collection. The first (No. 105), is a typical Yorkshire form, and has very broad lozenge-shaped wings, and a ridge at the bottom of these for use as a stop. It seems devoid of external decoration, and contains some rather deep circular pittings, especially on the part formerly covered by the handle.

It is $5\frac{3}{4}$ ins. long, is an inch wide in the middle; the wings, which extended about half way, are $1\frac{1}{2}$ ins. across, and the cutting edge is $2\frac{3}{4}$ ins. in length. It is a particularly solid form, and weighs 15 ozs. (Fig. 4).

The other example (No. 106) is quite fresh and almost devoid of patination, is slightly blunted at the cutting edge, and is hammered at the top, evidently through having been used as a chisel in comparatively modern times. It is rather long and slender. The wings do not extend quite so far down the blade; there are no stop ridges whatever, and, like the preceeding, it is a solid type of weapon. It was found near Sessay, in the East Riding. Its present measurements are $5\frac{3}{4}$ ins. long, $\frac{3}{4}$ in. wide in the middle, the wings are $1\frac{5}{8}$ ins. across, and extend to the distance of $2\frac{1}{2}$ ins. from the top. In the centre of one wing is a slight groove, evidently indicating the position of two halves of the mould. The cutting edge is $2\frac{1}{4}$ ins. long, and the specimen weighs $13\frac{1}{2}$ ozs. (Fig. 5).

No. 107 is a palstave, much corroded, and gives the impression of having had a loop, but if so, this has been broken off and filed away. From the way in which the two edges of the blade have been broken, and from the crystalline structure shown upon one of the fractures, this axe would appear to have contained a certain amount of impurities, as in texture it bears a resemblance to the bronze axes from Windsor recently figured in these columns (*The Naturalist*, 1922, p. 221).

The axe is provided with the usual depressions for the split shaft, and has two good stops or ridges, below which are traces of a bracket-like ornament extending to about $\frac{3}{4}$ in. below the stops. On one side, which has not been corroded so much as the other, there is a distinct medial ridge extending from the centre of the stop almost to the cutting edge.

The specimen measures $5\frac{1}{4}$ ins. in length, is $\frac{3}{4}$ in. wide in the middle, and $\frac{3}{4}$ in. in the widest part at the sides. The present cutting edge is irregular, measuring about $2\frac{1}{2}$ ins. Weight, $8\frac{1}{2}$ ozs. It was purchased as 'from Darlington.' (Fig. 6).

No. 108 is of a somewhat similar type, and has a loop. It is just as it came from the mould, and is not hammered out nor finished. The metal is of a much better quality than No. 107, but has evidently cooled too quickly, or at any rate there is an imperfection in the casting, there being a hollow in the thickest part of the axe, which is connected by a circular hole occurring on each side of the stop ridge. There are indications of other imperfections in the upper part of the axe, where, to the extent of $\frac{3}{4}$ in. or so, it has been broken or cut away.

No locality was given with this specimen when obtained, but it as was purchased with the Darlington one just mentioned it may be from the north of England.

Mr. Leslie Armstrong, who has been sketching these Bronze



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Bronze Mould and Bronze Axes.

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Bronze-Age Axes.

Axes for a Committee of the British Association, arranged for this specimen to be analysed by Professor Cecil H. Desch, who gives the following particulars as a result of his examination of the metal :—

Copper	...	...	80.25 per cent.
Tin	...	...	16.39 ,,
Lead	...	...	0.16 ,,
Iron	...	...	nil. ,,
Nickel	...	...	0.47 ,,
Sulphur	...	...	0.24 ,,
Zinc	...	...	nil. ,,

On comparing this analysis with that of the Windsor axes, given in *The Naturalist* for July, 1922, page 221, it will be seen that there is a higher percentage of copper in this example. The proportion of tin is practically the same, and in other respects there is no very great difference.

The specimen is 5 ins. in length, $\frac{3}{4}$ in. both in width and depth at the middle, the cutting edge, which has not been hammered out, is $1\frac{1}{2}$ ins. wide, there are just traces of a bracket-like decoration under the stop, and a medial ridge, which extends about half way down the blade. There is a pronounced ridge defining the limits of the two halves of the mould, but it is not in the centre, especially on one of the sides. Weight, 12 ozs. (Fig. 7).

No. 109 is still another example from the Scarborough hoard, which was purchased at the time of the discovery by a London dealer, who has recently agreed to let us have it to place with the remainder of the Scarborough collection. This makes 23 pieces from this hoard now in the Museum.

The axe is in as good condition as any that have been found at Scarborough. It is as released from the mould, has not been hammered nor completed in any way, and the ridges where the halves of the moulds met are particularly sharp, and have not been filed. The specimen is unusually wedge-shaped, has a collar at a distance of $\frac{1}{2}$ in. from the top, from which the usual three ridges extend down the face of the axe for about half its length. The top is square in section, is $1\frac{1}{2}$ ins. wide each way, the axe is $3\frac{1}{4}$ ins. long $1\frac{1}{4}$ ins. wide, and the cutting edge $1\frac{3}{4}$ ins. in length. Weight, 9 ozs. According to the label, it was found in November, 1916, 'with twenty-three others, after a land-slip near Scarborough.' (Fig. 8).

No. 110 was sold as from the Scarborough hoard, but its state of preservation, etc., indicate clearly that it has nothing to do with Scarborough, especially as the next example, which is distinctly Irish in type, was also said, by the local dealer from whom we bought it, to have been part of the Scarborough hoard. Apparently he has been victimised as

regards locality. This example is a socketed axe which has been considerably worn by use on the corner next to the loop, evidently by being used as a hammer. It is rather more slender than usual, wedge-shaped, squarish at the socket, the mould ridges being still prominent. From the corrosion of its surface, especially near the loop, it would appear to have been obtained from a peaty deposit, where the acids have had some effect upon the metal. It is distinctly of the type found in East Anglia, in which locality it was probably originally found. It is $3\frac{7}{8}$ ins. long, $1\frac{1}{8}$ ins. wide in the centre, there is a double collar near the top, but no trace of any lines extending therefrom along the blade. The socket is squarish, $1\frac{1}{4}$ ins. by $1\frac{3}{8}$ ins. There is no line on the inside of the casting. The cutting edge is modified, and is $1\frac{7}{8}$ ins. long. Weight, 8 ozs. (Fig. 9).

No. III is a typical Irish celt, small and 'squat,' wedge-shaped, with a circular socket, and a plain collar $\frac{1}{4}$ in. from the top, and with fairly prominent ridges at the joints of the mould. Except for the collar there is no decoration. Inside, two prominent ridges occupy the lower half of the socket, extending so as to join together in the middle, forming a distinct bridge.

The specimen is $2\frac{1}{8}$ ins. in length, $1\frac{1}{4}$ ins. wide, the socket measures $1\frac{1}{4}$ ins. across, the cutting edge 2 ins. in length, and it weighs 4 ozs. (Fig. 10).

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The New Phytologist for February is almost largely devoted to further contributions on 'Permeability,' by W. Stiles; and 'Physiological Studies in Plant Anatomy,' by J. H. Priestley and J. Ewing.

Dr. D. Woolacott describes a boring near Crook, County Durham, which reaches to a depth of 2911 feet, and gives valuable geological information, in *The Geological Magazine* for February.

In *Man* for February, C. E. P. Brooks writes on 'The Age of the Chalky Boulder Clay,' and comments upon the newness of the appearance of the glacial deposits around Bridlington.

British Birds for February contains the late J. H. Gurney's 'Twenty-ninth Annual Report on the Ornithological Notes from Norfolk,' as well as an illustrated Obituary notice of that author, and of the late H. J. Elwes.

Nature, No. 2776, contains a lengthy criticism of Dr. J. C. Willis's recent work on 'Age and Area,' by Professor W. Bateson; and also a particularly interesting article on 'Breeding Places and Migration of the Eel,' by Dr. Johs. Schmidt, of Copenhagen.

A paper on 'Bird Pellets and their evidence as to the Food of Birds,' by C. Thompson, and giving evidence of tremendous research, appears in *The Essex Naturalist* issued in March; which also contains 'Notes on the Gizzard Contents of Birds collected by Mr. Miller-Christy,' by Alice Hibbert-Ware.

The Lancashire and Cheshire Naturalist for 'December 1922-January 1923' (an awkward date for the bibliographer) is full of good material—principally local—(a description of a new fly from Khartoum seems out of place here), and J. W. Jackson appeals for the formation of a Lancashire and Cheshire Naturalists' Union.

INSECT FAUNA OF THE KINGMOOR (CUMBERLAND) NATURE RESERVE.

F. H. DAY, F.E.S.

IN *The Naturalist*, 1915, pp. 190, 191, and pp. 238-240, I published a list of Lepidoptera and Coleoptera found in the Kingmoor Nature Reserve on the outskirts of Carlisle. Since that time I have further investigated its insect fauna, and have added considerably to the species then recorded. In addition, attention has been paid to some of the other Orders. Considering its small extent, and proximity to the city of Carlisle, Kingmoor is wonderfully rich in insects. In the case of the Coleoptera, the list extends to 334 species (78 in the present and 256 in the former list), nearly one-fifth of the total in the list for the whole of the county of Cumberland; while in the Hemiptera-Heteroptera, 56 species have been found in the Reserve—more than a quarter of the entire Cumberland list.

LEPIDOPTERA (2nd list).

RHOPALOCERA.

Brenthis euphrosyne L.

SPHINGES.

Hemaris tityus L.

The following list of *Micros* is partly based on notes made a few years ago, and before Kingmoor became a Nature Reserve.

PYRALIDES.

Scoparia ambigualis Tr.
S. truncicolella Sta.
Nomophila noctuella Schiff.
Scopula lutealis Hb.
S. olivalis Schiff.
Botys fuscalis Schiff.

PTEROPHORI.

Chrysocoris festaliella Hb.
Platyptilia ochrodactyla Hb.
Amblyptilia acanthodactyla Hb.
Mimaeseoptilus pterodactylus L.
Oedematophorus lithodactylus Tr.
Alucita hexadactyla L.

CRAMBI.

Crambus pratellus L.
C. tristellus Fb.

Crambus culmellus L.
C. hortuellus Hb.

TORTRICES.

Tortrix xylosteana L.
T. heparana Schiff.
T. corylana Fb.
T. viridana L.
T. unifasciana Dup.
T. ministrana L.
T. forsterana Fb.
Amphisa gerningana Schiff.
Peronea schalleriana L.
P. variegana Schiff.
Bactra lanceolana Hb.
Phoxopteryx biarcuana St.
P. myrtilana Tr.
P. lundana Fb.
Grapholitha ramella L.
Paedisca solandriana L.
Ephippiphora cirsiana Zell.
E. pflugiana Haw.

Peronea aspersana Hb.
Rhacodia caudana Fb.
Teras contaminana Hb.
Dictyoptyx loeflingiana L.
Penthina betulaetana Haw.
Pardia tripunctana Fb.
Sericoris lacunana Dup.
S. urticana Fb.
Cnephasia musculana Hb.
Sciaphila subjectana Gn.
Coccyx argyrana Hb.
Stigmonota perlepidana Haw.
Dicrorampha herbosana Bar.
Catoptria ulicetana Haw.
C. cana Haw.
Symaethis oxycanthella L.
Eupoecilia ciliella Hb.
Tortricodes hyemana Hb.

TINEAE.

- | | |
|---|---|
| <i>Diurnea fagella</i> Fb. | <i>C. caespititiella</i> Zell. |
| <i>Scardia cloacella</i> Haw. | <i>C. fuscedinella</i> Zell. |
| <i>Incurvaria masculinella</i> Fb. | <i>Harpipteryx xylostella</i> L. |
| <i>Micropteryx calthella</i> L. | <i>Depressaria umbellana</i> St. |
| <i>M. aureatella</i> Scop. | <i>D. assimilella</i> Tr. |
| <i>M. purpurella</i> Haw. | <i>D. applana</i> Fb. |
| <i>M. unimaculella</i> Zett. | <i>Gelechia ericetella</i> Hb. |
| <i>M. subpurpurella</i> Haw. | <i>Teleia proximella</i> Hb. |
| <i>M. caledoniella</i> Griffith. | <i>Anarsia spartiella</i> Schr. |
| <i>M. sangiella</i> Wood. | <i>Pleurota bicostella</i> Clerck. |
| <i>Nemophora swammerdamella</i> L. | <i>Butalis grandipennis</i> Haw. |
| <i>Adela viridella</i> L. | <i>Glyphipteryx fuscoviridella</i> Haw. |
| <i>Argyresthia nitidella</i> Fb. | <i>Plutella cruciferarum</i> Zell. |
| <i>A. semitestacella</i> Curt. | <i>Laverna epilobiella</i> Schr. |
| <i>A. conjugella</i> Zell. | <i>Elachista albifrontella</i> Hb. |
| <i>A. pygmaeella</i> Hb. | <i>E. rufocinerea</i> Haw. |
| <i>A. brockeella</i> Hb. | <i>E. argentella</i> Clerck. |
| <i>Gracilaria alchimiella</i> Scop. | <i>Lithocolletis irradiella</i> Scott. |
| <i>Coleophora pyrrhulipennella</i> Tisch. | <i>L. spinolella</i> Dup. |
| <i>C. genistae</i> Sta. | <i>Cemiosoma spartifoliella</i> Hb. |

ODONATA (First List).

- | | |
|----------------------------------|-------------------------------------|
| <i>Pyrrhosoma nymphula</i> Sulz. | <i>Agrion puella</i> L. |
| <i>Ischnura elegans</i> Lind. | <i>Enallagma cyathigerum</i> Charp. |

COLEOPTERA.

- | | |
|-------------------------------------|-------------------------------------|
| <i>Leistus fulvibarbis</i> Dj. | <i>Quedius semiaeneus</i> Steph. |
| <i>L. rufescens</i> F. | <i>Gabrius appendiculatus</i> Shp. |
| <i>Dyschirius globosus</i> Hbst. | <i>Philonthus splendens</i> F. |
| <i>Bradycellus placidus</i> Gyll. | <i>P. intermedius</i> Bois. |
| <i>Harpalus aeneus</i> F. | <i>Othius myrmecophilus</i> Kies. |
| <i>Pterostichus nigritya</i> F. | <i>Stenus buphthalmus</i> Er. |
| <i>Amara lunicollis</i> Schiöd. | <i>S. nigritylus</i> Gyll. |
| <i>A. apricaria</i> Pk. | <i>S. cicindeloides</i> Gr. |
| <i>A. plebeia</i> Gyll. | <i>S. tarsalis</i> Ljun. |
| <i>Dromius linearis</i> Ol. | <i>Oxytelus sculpturatus</i> Gr. |
| <i>D. quadrinotatus</i> Pz. | <i>Trogophloeus rivularis</i> Mots. |
| <i>D. melanocephalus</i> Dj. | <i>T. elongatulus</i> Er. |
| <i>Haliphus fulvus</i> F. | <i>Lesteva longelytrata</i> Goeze. |
| <i>Hydroporus rufifrons</i> Duft. | <i>L. sicula</i> Er. |
| <i>H. discretus</i> Fair. | <i>Olophrum piceum</i> Gyll. |
| <i>H. pictus</i> F. | <i>Phloeobium clypeatum</i> Müll. |
| <i>Acilius sulcatus</i> L. | <i>Liodes humeralis</i> Kug. |
| <i>Dytiscus marginalis</i> L. | <i>Agathidium varians</i> Beck. |
| <i>Hydrobius picicrus</i> Th. | <i>Ptomaphagus sericeus</i> Pz. |
| <i>Laccobius alutaceus</i> Th. | <i>Neuraphes angulatus</i> Müll. |
| <i>L. minutus</i> L. | <i>Eumicrus tarsatus</i> Müll. |
| <i>Philodrus fuscipennis</i> Th. | <i>Tychus niger</i> Pk. |
| <i>Helophorus ytenensis</i> Shp. | <i>Euplectus piceus</i> Mots. |
| <i>H. minutus</i> F. | <i>Chilocorus bipustulatus</i> L. |
| <i>Ochthebius bicolon</i> Germ. | <i>Nitidula bipustulata</i> L. |
| <i>O. rufimarginatus</i> Steph. | <i>Thalycra sericea</i> Stm. |
| <i>Cryptopleurum atomarium</i> Ol. | <i>Enicmus testaceus</i> Steph. |
| <i>Gyrophæna affinis</i> Man. | <i>Atomaria atricapilla</i> Steph. |
| <i>Hypocyrtus laeviusculus</i> Man. | <i>A. apicalis</i> Er. |
| <i>H. apicalis</i> Bris. | <i>Aphodius contaminatus</i> Hbst. |
| <i>Tachyporus brunneus</i> F. | <i>Telephorus paludosus</i> Fall. |
| <i>Mycetoporus lepidus</i> Gr. | <i>Malthinus punctatus</i> Fourc. |

Saperda populnea L.
Phaedon armoricae L.
Apion nigritarse Kirb.
A. viciae Pk.
A. gyllenhali Kirb.
A. ebeninum Kirb.
Polydrusus flavipes DeG.

Sitones flavescens Marsh.
Orchestes salicis L.
Mecinus pyrastrer Hbst.
Poophagus sisymbrii F.
Rhinoncus pericarpus L.
Ceuthorrhynchus chalybaeus Germ.
C. litura F.

HEMIPTERA-HETEROPTERA (1st list).

Piezoderus lituratus F.
Picromerus bidens L.
Stygnocoris pedestris Fall.
Drymus brunneus Sahlb.
Scolopostethus decoratus Hahn.
Dictyonota strichnocera Fieb.
Monanthia cardui L.
Velia currens F.
Gerris lacustris L.
Nabis flavomarginatus Scholtz.
N. limbatus Dahlb.
N. fesus L.
Salda c-album Fieb.
Anthocoris confusus Reut.
A. nemoralis F.
A. nemorum L.
Microphysa pselaphiformis Curt.
Pithanus maerkeli H.S.
Miris holsatus F.
M. calcaratus Fall.
Leptopterna ferrugata Fall.
L. dolabrata L.
Monalocoris filicis L.
Phytocoris ulmi L.
Calocoris sexguttatus F.
C. bipunctatus F.
Plesiocoris rugicollis Fall.
Lygus pabulinus L.

L. contaminatus Fall.
L. pratensis L.
L. kalmii L.
Rhopalotomus ater L.
Cyllocoris histrionicus L.
Aetorhinus angulatus F.
Mecomma ambulans Fall.
Orthotylus marginalis Reut.
O. ericetorum Fall.
O. tenellus Fall.
Harpocera thoracica Fall.
Phylus melanocephalus L.
P. palliceps Fieb.
Psallus betuleti Fall.
P. variabilis Fall.
P. varians H.S.
P. lepidus Fieb.
Plagiognathus chrysanthemi Wolff.
P. arborum F.
Asciodema obsoletum D. & S.
Notonecta glauca L.
Corixa sahlbergi Fieb.
C. limitata Fieb.
C. semistriata Fieb.
C. venusta D. & S.
C. fossarum Leach.
C. nigrolineata Fieb.
C. praeusta Fieb.

HEMIPTERA-HOMOPTERA (1st list).

Aphrophora alni Fall.
A. salicis DeG.
Philaenus spumarius L.
P. lineatus L.
Ulopa reticulata F.
Megophthalmus scanicus Fall.
Tettigonia viridis L.
Euacanthus interruptus L.
Batracomorphus lanio L.
Oncopsis alni Schr.
O. rufusculus Fieb.
O. flavicollis L.
Macropsis impura Boh.
Idiocerus populi L.

Acocephalus nervosus Schr.
Athysanus brevipennis Kbm.
A. griseus Zett.
A. obsoletus Kbm.
Deltocephalus distinguendus Flor.
Jassus mixtus F.
Thamnotettix subfuscus Fall.
T. cruentatus Panz.
Limotettix sulphurella Zett.
Empoasca smaragdula Fall.
Cixius pilosus Ol.
Conomelus limbatus F.
Stiroma albomarginata Curt.

Record Bags and Shooting Records, by **Hugh S. Gladstone**. London: H. F. & G. Witherby, 240 pp., 15s. net. Messrs. Witherby are gradually placing naturalists in a deeper and deeper debt for the valuable information they publish from time to time. Their latest production, by our contributor, Mr. Gladstone, also contains some account of the evolution of the sporting-gun, marksmanship, and the speed and weight of birds, topics of particular interest to our readers. The author is able to go back to ancient Egyptian times, and by illus-

trations of various methods of killing and securing game (even reproducing pictures from *Punch*), he has succeeded in making an exceedingly readable

GAME KILLED BY MARQUIS OF RIPON FROM 1867 TO 1913.

DATE	PHINOCEROS	TIGER	BUFFALO	SAMUR	PIG	DEER	RED DEER	GOOSE	PARTRIDGES	PHEASANTS	WOODCOCK	SNIFE	WILD DUCK	BLACK GAME	CAPERCALZIE	HARES	RABBITS	VARIOUS	TOTAL
1867							8	265	1,179	741	20	22	10			719	934	115	4,013
1868							35	201	1,418	1,601	28	67	23			690	543	113	4,719
1869							35	135	1,659	1,431	26	133	37			547	443	122	4,568
1870							21	498	2,309	2,117	36	53	30			833	626	137	6,660
1871							55	1,408	1,598	1,889	50	244	42			1,093	341	225	6,945
1872							38	1,498	2,083	2,835	27	60	31			1,108	756	235	8,671
1873							25	248	2,417	3,050	95	263	85			1,027	450	591	8,251
1874						3	5	90	2,878	2,345	229	462	131	5	4	1,200	302	1,200	8,854
1875							3	287	2,882	3,225	176	461	208			1,376	576	743	9,937
1876							3	1,554	3,394	4,110	30	25	37			1,248	890	266	11,557
1877						2	4	2,032	2,359	4,235	35	45	33	11	11	1,496	1,044	309	11,616
1878						4	9	1,669	3,378	4,679	43	44	55	5	6	2,152	667	503	13,214
1879							4	1,344	630	3,140	132	92	62	9	11	1,125	287	215	7,051
1880		9	6	18	31	73	12	1,131	682	531	9	47	54	26	5	501	141	408	3,684
1881							5	1,566	3,465	5,014	26	14	43			1,658	791	166	12,148
1882	2	2	6	1	66	104	10	3,025	2,123	2,370	14	21	44			464	1,122	117	9,491
1883							5	2,696	1,845	6,119	157	84	155			918	1,386	319	13,884
1884							10	3,073	3,523	4,347	134	70	70			713	1,896	453	14,289
1885							5	2,015	2,788	4,620	104	23	31			589	2,547	108	12,830
1886							20	1,989	1,463	3,383	105	87	72			357	786	349	8,611
1887							57	2,258	3,785	3,387	104	3	12			415	2,328	237	12,586
1888							4	3,060	853	5,072	31	151	10			307	1,523	85	11,096
1889							5	3,081	5,751	6,182	100	109	14	38	8	1,747	1,069	135	18,239
1890								2,006	7,002	6,498	172	105	28			1,446	1,120	123	18,500
1891								2,277	1,699	5,794	34	13				711	406	271	11,205
1892							1	1,412	6,784	5,580	7	10	5			453	1,233	281	15,766
1893								2,611	8,732	5,760	66	7	42			837	914	166	19,135
1894							1	2,567	7,261	5,034	76	7	12			935	580	222	16,695
1895							1	1,272	3,461	6,101	11	13	17			352	1,040	210	12,478
1896								2,649	2,613	8,514	13	11	4			814	557	177	14,852
1897							1	2,797	1,914	7,850	67	10	47			358	828	152	14,024
1898								1,693	1,200	3,432	18	3	6			169	298	144	6,963
1899								820	1,309	4,605	19	2	57			205	609	137	7,763
1900								1,033	1,322	6,762	24	8	95			223	819	141	10,427
1901								2,037	1,991	8,478	8	11	141			262	595	114	13,637
1902								1,706	1,701	4,998	11	3	166			268	479	280	9,612
1903								1,890	462	4,709	16	3	213			206	647	111	8,257
1904								1,355	1,794	5,032	17	13	127			186	173	114	8,811
1905								1,636	2,292	6,939	15	11	111			238	582	206	12,030
1906								2,179	2,019	8,647	22	12	268			230	416	212	14,005
1907								1,268	477	4,386	15	7	111			88	152	144	6,648
1908								1,523	364	5,764	29	9	109			159	183	176	8,316
1909								2,036	653	6,374	25	15	115			155	195	195	9,763
1910								1,923	770	6,115	24	12	155			150	89	234	9,472
1911								2,036	978	6,463	23	5	59			158	143	191	10,056
1912								1,810	518	7,539	18	1	103			251	409	45	10,694
1913								1,461	820	5,179	13	11	172			243	203	131	8,233
	2	11	12	19	97	186	382	79320	112598	222976	2454	2882	3452	94	45	30280	34118	11328	500256

narrative, and his statistics are certainly remarkable. Through the kindness of the publishers we are able to reproduce a record of game killed by one well-known Yorkshireman, who apparently was responsible for something over 500,000 head.

TWO BRITISH MITES NEW TO SCIENCE AND A NEW SUBGENUS OF MACROCHELES Latr.

W. FALCONER, F.E.S.

THE mites belonging to the genus *Macrocheles* Latr. may be readily singled out from the rest of the Gamasidae (brown mites with shields above and below the body) by the absence of an ambulacrum (figs. 2a and 4a) to the first pair of legs. The cuticle of the shields and legs is strongly chitinated and generally roughened with firmly marked reticulations. The dorsal shield does not extend over the whole surface, but leaves uncovered a pale coloured margin, more or less wide, behind and at the sides. The shoulders are always very distinct. The second pair of legs are thicker than the rest and the fourth pair the longest, while both pairs in the male are often spurred. The genital and anal shields are not in contact, but usually very distinctly separated. The genus has recently been revised by Berlese and split up into five subgenera.

1. GEHOLASPIS. Crest of the epistome undivided and spine-like. Body rounded, never scabrid or viscid. Yorkshire example, *M. longispinosus* Kr.

2. NOTHROHOLASPIS. Crest of epistome forked at apex. Dorsal setæ thick or clavate. Body oval or slightly elongated. Cuticle usually scabrid and more or less viscid. Yorkshire examples, *M. tridentinus* Can., *N. hullii* spec. nov.

3. MACROCHELES Latr. Apex of epistome forked on a forked lamellar base. Body ovate or quadrate. Femora of fourth pair of legs in the male not spurred. Yorkshire examples: *M. plumipes* Hull, *marginatus* Herm., *cognatus* spec. nov.

4. COPRHOLASPIS. All the dorsal setæ simple, curved and acute; *M. glaber* Müll., epistome as in *Macrocheles*, and *M. pisentii* Berl., epistome as in *Nothrolaspis*. The former occurs in Yorkshire. In this country, however, there is another subgenus, which Berlese does not include in his revision, for which the name of DISSOLONCHA is here proposed with *M. superbus* Hull as the type, and characterised as follows:—Apex of the epistome forked on a forked lamellar base. Body elongate pentagonal or oval. Dorsal scutum in two parts of diverse texture. The femora of the second and fourth pairs of legs in the male spurred. The type species, which occurs in Yorkshire, has the patellæ of the fourth pair of legs in the male spurred. In the other species, *M. gladiator* Hull, they are unspurred. The number included in the subgenus will shortly be increased.

The two species described and figured in this paper are believed to be new to science. This is the opinion also of the

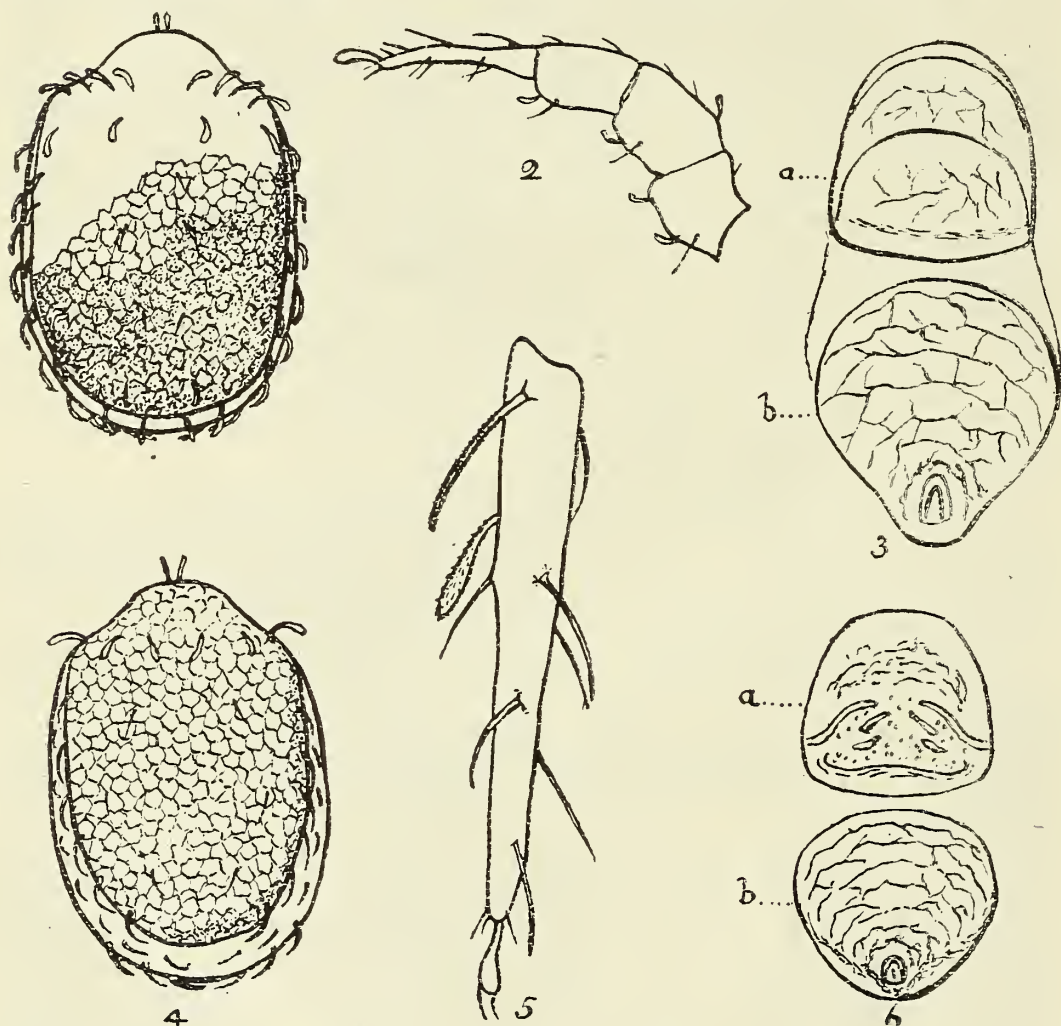
Rev. J. E. Hull, who is in possession of Northumbrian specimens, so that both are likely to be widely diffused. They fall into different subgenera as defined above.

MACROCHELES COGNATUS spec. nov.

Figs. 4 5, 6.

Size.—Male, 1100 μ ; female, 1300 μ .

Colour ruddy brown. Body oval with two clavate setæ at the front margin. Dorsal shield narrowed behind with a



Nothrolaspis hullii spec. nov.

Fig. 1. Body of female.

Fig. 2. Leg II. of female.

Fig. 3. Ventral scuta of female.

a. Genital shield.

b. Anal shield.

Macrocheles cognatus spec. nov.

Fig. 4. Body of male and female.

Fig. 5. Tarsus of legs IV. of male and female.

Fig. 6. Ventral scuta of female.

a. Genital shield.

b. Anal shield.

plumose seta near each shoulder and four setæ in a transverse line across the forepart, all curved and clavate, followed by three pairs of simple ones on the disc (fig. 4).

Epistome forked at the apex on a forked lamellar base.

Legs.—Tarsi of fourth pair without clavate setæ, but with

one plumose seta (fig. 5). Tarsi of first pair without a lateral plumose seta. In the male the second pair are spurred, but not the fourth.

Sternum.—With some punctures and raised, mostly median and basal, reticulations.

Ventral shields approximate. *Anal* (fig. 6b) somewhat heart-shaped, a little wider than long, convex all round, and irregularly reticulated with raised ridges. *Genital* (fig. 6a) upper portion hyaline, and below it slight corrugations; then a distinct ridge from near the centre to each lateral margin, followed by two shorter ones towards the inner extremity of each; punctate behind and in the middle.

M. cognatus is closely allied to *M. marginatus* Herm., but the latter has no plumose seta on tarsus IV. and the shape, relative size and sculpture of the ventral shields of the female are quite different.

Found amongst dead leaves, sphagnum and heaps of cut grass in a field at Slaithwaite, first examples May, 1919.

NOTHROHOLASPIS HULLII spec. nov.

Figs. 1, 2, 3.

Size.—Male unknown; female 1200 μ .

Colour brown. *Body* slightly elongate oval and the cuticle somewhat scabrid, with the usual pair of clavate setæ in front. *Dorsal shield* with eight curved setæ in two rows of four directed obliquely upwards and inwards, one from each shoulder; and four others across the back just behind the shoulders, all the above clavate, followed by three pairs of thickened setæ on the disc (fig. 1).

Crest of epistome forked at apex, but not on a lamellar base.

Sternum punctate and without ridges.

Legs.—Formation of the second pair of the female with the distinctive setæ of the joints and their position shown in fig. 2.

Ventral shields approximate. *Anal* (fig. 3b) rounded with the posterior portion a little drawn out, irregularly reticulated with slightly raised ridges. *Genital* (fig. 3a) in three transverse parts, the anterior on hyaline, the other two reticulated with slightly raised ridges, but the margins of both clear of them.

I have the greatest pleasure in associating with it the name of the Rev. J. E. Hull, not only for his pre-eminent services to British Arachnology, but also as an enduring memorial of a personal friendship dating back to our youthful days.

N. hullii is allied to two others in the same group, but in *N. terreus* C. and F. tarsus II. has six thickened spines near its apex, and in *N. tridentinus* Can. all the dorsal setæ are clavate.

Two examples were taken from vegetable débris on the sloping bank of Winterset Reservoir, near Wakefield, in May, 1919 (Yorkshire Naturalists' Meeting).

VERTEBRATE ZOOLOGY IN YORKSHIRE.

A MEETING of the Vertebrate Section of the Yorkshire Naturalists' Union was held at Leeds on Saturday, February 17th, Mr. C. F. Procter presiding, and was preceded by a meeting of the Yorkshire Wild Birds and Eggs Protection Acts Committee, Mr. W. H. St. Quintin being in the chair.

A vote of thanks to the retiring President, Mr. S. H. Smith, was unanimously carried.

A paper was read by Mr. H. E. Forrest, of Shrewsbury, on 'The Antiquity of the Sheep in Relation to the Early Peoples of Britain,' which occurs on another page in this issue. After an exhaustive analysis of the data supplied by cave deposits and tumuli, the author concluded that there were no sheep in Britain in Pleistocene or Neolithic times, and that they were probably introduced during the Bronze Age.

In the discussion following, Major Bliss, of the Wool Research Association, suggested that the number of tail vertebrae might in some instances decide whether the early British sheep had long or short tails.

Mr. H. B. Booth pointed out that British sheep were peculiar in having long tails, and thought it could only be explained if an early British long-tailed sheep had existed and died out; he also thought that the number of tail vertebrae might enable the remains of sheep to be distinguished from those of goats.

Mr. E. W. Wade asked for information regarding the origin of the sheep in the Island of St. Kilda.

Mr. H. E. Forrest, in replying, said that an early British sheep had undoubtedly died out before the Ice Age, and that the ancestry of all our domesticated sheep was very obscure.

'Notes on the Sexes of the Chaffinch in Winter,' were then read by Mr. W. G. Bramley, who first gave extracts from the writings of some of the older Naturalists: thus Linnaeus, Selby and Gilbert White believed that only hen birds were seen in flocks during the winter. The Rev. C. A. Johns and W. H. Hudson were of opinion that the males were largely confined to the north and the females to the south, while mixed flocks were found in the midlands. Charles Waterton noted no separation at Walton Hall, and the same applied to the districts around Harrogate, Huddersfield, Wilsden, and Longliddale, in Westmorland, though at this last place females preponderated. In the Tadcaster and Fairburn district, the author had noticed flocks of males or females only, as well as mixed flocks, but the males preponderated. He thought this segregation of the sexes to be more applicable to our immigrant birds, and quoted Seebohm as writing 'It is probable that this peculiar habit is confined to the birds that come to our shores in autumn.' The ringing of birds gave the following results as regards this species. Five nestlings and twenty-two adults were recovered, all in the districts in which they had been ringed. This certainly pointed to the flocks being composed of immigrant birds.

A lively discussion followed, to which the following contributed:—

Mr. E. W. Wade had observed no segregation and no large flocks in East Yorks.

Mr. S. H. Smith said that the cocks left the York area before winter, and there were no large flocks.

Mr. W. H. Parkin said that males greatly preponderated in Saltaire Park, and reported mixed flocks, but none of females alone.

Mr. F. H. Edmondson had noticed detached pairs on the outskirts of the migratory flocks.

Mr. R. Chislett has seen flocks of either sex in the Peak district, and also stationary pairs.

Mr. Haigh Lumby said that male birds preponderated in the Keighley district, but flocks of females were seen early in the year.

Mr. H. B. Booth said that male birds preponderated in the Ilkley district, but stationary birds were also seen. The largest flock he had seen was composed of females. He once witnessed a flock of exhausted Chaffinches raining into the sea and drowning without a struggle, while he was crossing the Wash in an open boat.

Mr. H. E. Forrest said that in the Shrewsbury district flocks of males preponderated, and he thought that they remained longer in flocks because they were late nesters.

Mr. R. Fortune said that in the Harrogate district they were mostly males, with a small proportion of females and also isolated resident birds.

Mr. C. F. Procter thought the segregation of sexes not surprising, as it was not at all uncommon in wild nature.

At the evening meeting, Mr. E. W. Wade read a paper on 'The Little Owl.' This bird was becoming well established in the East Riding, and he thought the time opportune to trace its distribution and line of immigration, and also to decide whether it was a desirable addition to our Avi-fauna.

The first attempts made to introduce it by Charles Waterton and Mr. W. H. St. Quintin were not successful, but those liberated by Lord Lilford and Mr. Meade-Waldo about 1874, bred at Lilford in 1889 and in Kent in 1879.

From these two centres the birds had spread rapidly over the southern and midland counties, and in 1907-1908 were estimated at 200 to 300 pairs of nesting birds in Bedfordshire alone. Since then it had spread through parts of Lincolnshire, Yorkshire, Lancashire, Derbyshire and even penetrated Northumberland. In Yorkshire it is well established in the Derwent valley and in the Pocklington district, from which it is rapidly spreading over East Yorkshire.

The author had found the remains of the Thrush, Chaffinch, House-Sparrow and Bank Vole in its feeding holes in Huntingdonshire, where the Little Owl was so numerous that a keeper had shot fifty in one year.

Mr. Coward found the food to consist chiefly of beetles and small mammals; Mr. Witherby of beetles and earthworms; and Mr. Meade-Waldo found insects, earthworms and mice to be the normal food, except during the nesting season, when they killed a great many small birds.

Mr. W. H. St. Quintin had observed them feeding on earthworms; Mr. Lloyd had surprised a bird sucking the last of a clutch of Wild Duck's eggs; and Mr. G. T. Atchison reported the finding of remains of 74 young Pheasants in one nest; while Dr. W. E. Collinge gave the food percentage as .51 of game birds and 4.45 of wild birds in the stomach, and 2.5 of young birds in pellets.

In conclusion, the author thought the reports favourable, except during the nesting season, when its habits should be closely watched.

In the discussion which followed, some apprehension was expressed by Messrs. C. F. Procter, R. Fortune, E. W. Taylor and Prof. Garstang, that the bird might become so numerous as to be a serious menace to our song birds. Mr. H. B. Booth thought that it avoided hilly country.

Mr. C. F. Procter next read a paper on 'British Reptiles,' and after describing the six existing species, commenced, with the aid of lantern slides, to trace their evolution from the earliest forms of life found in the Cambrian deposits. By means of a chart, the author showed that all vertebrate life had a marine origin, and that the early Zoophytes gave rise to larger and more complex forms of life, until in Cretaceous times the sea teemed with reptiles, many of which began to live a semi-aquatic life and gave rise to huge terrestrial reptiles of the most fantastic form.

Mr. R. Chislett gave a paper dealing with the Red Necked Phalarope, The Dunlin and The Common Gull, illustrated by a series of lantern slides. He first described a colony of six or eight pairs of Phalaropes he found nesting in the Shetlands, where he was much struck by their dainty movements, and their surprising buoyancy on the water. At first the birds

would not return to the nest, but eventually returned while the lecturer's wife was standing close to the nest, and remained sitting while she quietly withdrew. During bad weather the Phalaropes mysteriously seemed to disappear. The food consisted of insects and small marine life.

The Dunlin was also found nesting in Shetland on the grass covered ridges traversing swampy ground. The nests were very difficult to find in the long grass, and when found the contents had in more than one instance been destroyed by Crows and Skuas.

Photographs were shown of the Common Gull nesting among the lochs and islets in S.W. Scotland, the nest being usually screened by a rock or long heather. The Gulls were frequently observed to perch in trees.

In Shetland they were much persecuted by the Herring Gulls and Skuas. On one occasion a newly hatched chick jumped from a rock fifty feet high into the sea, where its parents joined it and guided it back to the beach, where it landed none the worse for its adventure.

E. WILFRED TAYLOR.

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A certain column in our copy of a recent *Yorkshire Weekly Post* is headed 'Lies to Correspondents.'

T. D. A. Cockerell writes on 'The Earliest-known Ponerine Ant,' in *The Entomologist* for March.

E. C. Richardson describes 'Recent Developments in Rabbit-keeping for Fur' in *The Journal of the Ministry of Agriculture* for February.

The Annual Report and Balance Sheet of the Hastings and St. Leonards Natural History Society (20 pp.) has been issued, and contains a record of the Society's work during 1921-22.

Part 4 of Volume VI. of *The Proceedings of the University of Durham Philosophical Society* is a memorial to John Theodore Merz, and contains contributions by R. A. Simpson, P. P. Bedson, D. A. Gilchrist, A. Meek and R. F. A. Hoernlé.

Mr. Hans Schlesch favours us with a copy of his *Liste isländischer Land und Süßwassermollusken; Beitrag zur Lymnaeefauna Nord-Islands*; and *Pisidium hibernicum* Westerlund in Mecklenburg, reprinted from *Archiv für Molluskenkunde*.

Among the contents of *The Transactions of the Entomological Society of London*, recently issued, we notice 'On the Occurrence, near London, of the Flea, *Ceratophyllus vagabundus* Boh., under unusual circumstances,' and 'Notes on the Biology of some British Neuroptera (Planipennia).

We learn from the *Report of the Bristol Museum* for 1922 just to hand, that £5117 have been spent during the year in new cases in the Geological Gallery. The report of the excellent work accomplished during the year is arranged under various heads such as Geology, Botany, etc., one being 'Bristolensis.'

Among the contents of *The Memoirs and Proceedings of the Manchester Literary and Philosophical Society* just received, we notice three dealing with Variation of *Sphaeria*, by Messrs. Alkins, Cook and Harwood, and 'The Problem of Megalithic Monuments and their Distribution in England and Wales,' by W. J. Perry.

The Journal of the East Africa and Uganda Natural History Society (Longmans, Green & Co., 40 pages, 6/6), gives an idea in its illustrations of the nature of the contents of the new Museum at Nairobi, and the way in which the specimens are arranged. Among the contents of this Journal are 'The Tribal Organisation of the Nandi,' by Charles Hemsted; 'African Sign-writing,' by C. W. Hobley; 'Sedimentary Rocks in the Northern Frontier, Kenya,' by V. Glenday; 'Geographical Variation in East African Butterflies.'

HEMIPTERA FROM THE BRIDLINGTON DISTRICT.

JAMES M. BROWN, B.Sc., F.L.S., F.E.S.

AMONG the localities noticed in Mr. Fordham's ' Preliminary List of Yorkshire Hemiptera ' (*The Naturalist*, October and December, 1921, and May, 1922) Filey occurs once only, but none of the places on the coast further south receives mention. Evidently the coastal region of V.C. 61 is a neglected area so far as *Hemiptera* is concerned.

During August, 1921 and 1922, I was able to collect a fair number of species at various places in the immediate neighbourhood of Bridlington, and as many of these have not yet been recorded for the county, and others only rarely, the full list of captures has been prepared. No attempt was made to collect aquatic forms.

Of the 114 obtained, 20 (5 Heteroptera, and 15 Homoptera, marked *) do not occur in the list mentioned, while several others receive only a single notice.

My thanks are due to Mr E. A. Butler for his generous help in confirming many of my determinations, and in naming species which were beyond me.

HETEROPTERA.

Stygnocoris pedestris Fall. Among grass, Bridlington.

Monanthia cardui L. On Thistle heads, Danes' Dyke and Bessingby.

This species has been recorded from Lythe by Mr. Butler.

Nabis limbatus Dahlb. Bridlington.

N. fesus L. Bridlington.

Salta saltatoria L. In damp places on the North Cliffs, Bridlington.

S. C-album Fieb. Along with the preceding, but more sparingly.

Anthocoris confusus Reut. Bessingby, Boynton and Easton.

A. nemoralis F. Bessingby and Boynton.

A. nemorum L. Boynton, etc.

Tetraphleps vittata Fieb. Plentiful on Conifers, Easton.

Acompocoris pygmaeus Fall. On Conifers, Boynton.

Triphleps majuscula Reut. Bessingby.

Pithanus maerkeli H.-S. North Cliffs, Bridlington.

Miris holsatus F. Plentiful among grass, Easton.

M. calcaratus Fall. Easton and Bessingby. Both these species were very plentiful at Easton in 1921, but scarce in 1922.

Megaloceræa erratica L. In long grass by the railway, Bessingby.

M. ruficornis Fourc. Fairly plentiful among grass, Easton.

Leptopterna ferrugata Fall. Among grass, Easton.

L. dolabrata L. With the last, but less common.

Phytocoris tilia F. Burton Agnes.

P. longipennis Flor. On Ash, Boynton, Burton Agnes.

P. ulmi L. Bridlington, Carnaby, Burton Agnes.

Calocoris sexguttatus F. Danes' Dyke and South Cliffs, Bridlington.

C. bipunctatus F. Common and widely distributed. Easton, Carnaby, Bessingby and Burton Agnes.

**C. lineolatus* Goeze. Fairly plentiful on Ononis, Easton.

- Lygus pabulinus* L. Common, Bridlington, Burton Agnes, Boynton, Carnaby.
- L. contaminatus* Fall. Bessingby.
- L. viridis* Fall. Bessingby.
- L. lucorum* Mey. On Ragwort. South Cliffs, Bridlington.
- L. pratensis* L. Common. Easton, Bessingby, Boynton.
- L. rubricatus* Fall. On Scotch Pine, Boynton, Easton. This species has been previously recorded for the county by Mr. Butler from Mulgrave Park.
- L. cervinus* H.S. Boynton and Burton Agnes, on Lime and Ash.
- L. pastinacæ* Fall. Bessingby. The only previous Yorkshire record is a very old one from Scarborough.
- L. kalmii* L. Bridlington.
- Liocoris tripustulatus* F. Bridlington.
- Rhopalotomus ater* L. Bessingby and Bridlington.
- Dicyphus epilobii* Reut. Danes' Dyke, Bessingby, Burton Agnes.
- D. stachydis* Reut. Boynton and Bridlington.
- Aetorhinus angulatus* F. Common on Ash, Burton Agnes, Boynton, Danes' Dyke.
- Mecomma ambulans* Fall. Common on Nettles, Bridlington, Bessingby, Boynton, Burton Agnes.
- Orthotylus viridinervis* Kb. On Elm, Burton Agnes.
- Malacocoris chlorizans* Fall. On Hazel, Boynton. A very delicate, and not very common species.
- **Megalocoleus molliculus* Fall. On Yarrow, South Cliffs, Bridlington.
- **Macrotylus solitarius* Mey. On Stachys, Boynton. Not common.
- M. paykulli* Mey. On Ononis, Easton, Danes' Dyke and South Cliffs.
- Byrsoptera rufifrons* Fall. Among Nettles and Stachys, Bessingby.
- **Phylus coryli* var. *avellanæ* Mey. Easton.
- **Psallus alnicola* D. and S. Burton Agnes, Boynton, Danes' Dyke.
- P. fallenii* Reut. Boynton.
- P. roseus* F. On Sallow, Burton Agnes.
- Atractotomus magnicornis* Fall. Very plentiful on Larch, Easton, Boynton, Bessingby. Previously recorded only from Sheffield.
- Plagiognathus chrysanthemi* Wolff. Common, Bridlington, Burton Agnes, Danes' Dyke.
- P. arbustorum* F. Common, Boynton, Burton Agnes, Bridlington. Some specimens were quite black, as noted by Mr. Fordham.
- Asciodema obsoletum* D. and S. Plentiful on Gorse and Broom, Wilsthorpe, Boynton, Danes' Dyke.
- Notonecta glauca* L. Bessingby.

HOMOPTERA.

- Aphrophora alni* Fall. Burton Agnes.
- Philænus spumarius* L. Common everywhere.
- P. campestris* Fall. Easton.
- P. lineatus* L. Bridlington, Bessingby, Burton Agnes.
- Megophthalmus scanicus* Fall. Easton, Bridlington.
- Euacanthus interruptus* L. Danes' Dyke, Easton.
- Batracomorphus lanius* L. On Oak, Easton, Boynton.
- **Idiocerus vitreus* Fab. On Lombardy Poplar, Burton Agnes.
- I. fulgidus* Fab. Burton Agnes.
- I. populi* L. Burton Agnes.
- I. confusus* Flor. On Sallow. Wilsthorpe, Carnaby, Bessingby.
- Agallia puncticeps* Germ. Common, Burton Agnes, Bessingby, Boynton.
- **A. venosa* Fall. Bessingby.
- A. brachyptera* Boh. At the roots of plants on the South Cliffs, Bridlington. This interesting little species does not seem to have

been noted since its discovery among cut grass at Scarborough by Mr. T. Wilkinson many years ago. At first sight it may easily be mistaken for an immature insect.

- Acocephalus nervosus* Schr. Common, South Cliffs, Bessingby, Burton Agnes.
A. albifrons L. Bridlington.
A. flavostrigatus Don. Under field litter, Easton, Bessingby.
Athysanus sordidus Zett. In similar situations to the last. Bridlington Burton Agnes, Bessingby.
 **A. plebejus* Fall. South Cliffs and Burton Agnes.
A. lineolatus Brulle. Bessingby, Boynton.
A. obsoletus Kbm. Bridlington.
Deltocephalus ocellaris Fall. Very common among grass, Bridlington, Carnaby, etc.
 **D. socialis* Flor. Not at all common, Danes' Dyke.
 **D. thenii* Edw. Plentiful among grass, Danes' Dyke, Carnaby, Easton.
D. pascuellus Fall. Plentiful, Danes' Dyke, Boynton, Burton Agnes, Carnaby.
D. paleaceus J. Sahl. Bridlington.
D. pulicaris Fall. Bridlington.
Jassus mixtus Fab. On Oak, Bridlington, Boynton.
Thamnotettix splendidulus Fab. Boynton.
Limotettix 4-notata Fab. Easton.
 **L. persimilis* Edw. Very common among grass. Easton, Danes' Dyke, Boynton, Burton Agnes, Bessingby. Probably this species is frequently confused with the previous one, differing from it only in the structure of the aedeagus.
L. aurantipes Edw. Burton Agnes, Boynton, Bessingby.
L. sulphurella Zett. Very common among grass. Danes' Dyke, South Cliffs, Boynton, Burton Agnes, Bessingby, Carnaby.
Cicadula 7-notata Fall. Burton Agnes, Wilsthorpe.
C. 6-notata Fall. Danes' Dyke, Carnaby, South Cliffs, Bridlington.
Alebra albostriella Fall. Burton Agnes, Danes' Dyke.
 **Eupteryx vittatus* L. Bessingby.
E. auratus L. Bridlington, Danes' Dyke.
E. atro-punctatus Goeze, Bessingby, Burton Agnes, Bridlington.
E. signatipennis Boh. Burton Agnes, Carnaby, Bessingby.
E. pulchellus Fall. Plentiful on Oak. Boynton, Burton Agnes.
Eupteryx concinna Germ. With the last. Burton Agnes.
Typhlocyba ulmi L. Burton Agnes, Bessingby.
T. tenerrima H.S. Common on Brambles, Boynton, Danes' Dyke.
 **T. douglasi* Edw. Boynton, Danes' Dyke.
T. crataegi Dougl. Very plentiful on Hawthorn, Bessingby, Danes' Dyke.
 **T. rosae* L. Plentiful. Boynton.
T. quercus Fab. This very pretty species was swarming on Blackthorn at Boynton and Burton Agnes.
T. geometrica Schr. Occasional, on Alder, Danes' Dyke.
 **Zygina coryli* Toll. Bridlington.
Cixius nervosus L. On Alder at Danes' Dyke.
Conomelus limbatus Fal. Fairly common among grass, Bessingby.
 **Delphax pellucida* Fab. Easton.
 **D. fairmairei* Perris. Easton.
Dicranotropis hamata Boh. Bessingby.
 **Aphalara picta* Zett. Bridlington.
Psylla alni L. Bridlington.
 **P. nigrita* Zett. On Conifers, Easton.
 **Trioza urticae* L. Very common on Nettles, Bessingby, Boynton, Carnaby, etc.

NORTHERN NEWS.

The death is announced of T. V. Holmes, F.G.S., a prominent member of the Geologists' Association; and of Professor James Ritchie, of Edinburgh.

Professor R. V. Wheeler, of Sheffield, has received the Greenwell Medal of the North of England Institution of Mining Engineers for his researches on coal.

Part 105 of *The Yorkshire Archæological Journal* contains a note on 'The Origin of the Name of Fountains Abbey,' by J. T. Fowler, who suggests that the springs and fountains which existed near Fountains Hall gave the name to the Abbey.

We should like to take this opportunity of thanking Dr. Woodhead for supplying the 32 pages containing his Presidential Address which were inserted in our March issue, and also congratulate his printers upon the way in which they were able to copy the type, etc., usually used in our Journal.

No. 53 of the *American Museum Novitates*, issued January 6th, is entirely devoted to an elaborately illustrated 'Notes on the Type of *Hesperopithecus haroldcookii* Osborn,' by W. K. Gregory and Milo Hellman, the paper having reference to a tooth found in America which Dr. Smith Woodward considers to be that of a bear.

'Once on a time an official of a department, driven beyond discretion by the delays of another department, addressed a letter to the "Controller of H.M. Stationary Office," and was dealt with in a disciplinary manner. Times have changed, and now a waggish printer's imp has the audacity to speak disrespectfully of the isobars in these words—"anti-cyclones . . . often remaining more or less stationary for several days." ' (Dr. Hugh Robert Mill, in *Nature*, Jan. 27th.)

At a recent meeting of the Lancashire and Cheshire Entomological Society, Mr. Mansbridge exhibited a single specimen of a species of Lepidoptera new to Britain called *Auximobasis normalis* (Meyr.), which he found on the dock wall, Liverpool, in September, 1921. It was probably imported as a larva or a pupa. He also showed a series of *Peronea hastiana* from the Isle of Wight, comprising vars. *divisana*, *radiana*, *centrovittana*, *combustana* and *brunneana*, with corresponding varieties from Lancashire localities for comparison. It was seen that the Lancashire specimens were all very much darker than the parallel forms from the Isle of Wight. Mr. Tyerman exhibited a very variable series of the same species which he had bred from Lancashire larvæ last year.

The annual meeting of Halifax Scientific Society was held recently under the presidency of Mr. H. Waterworth, when the 49th annual report was read by Mr. J. H. Lumb. This gave the total membership as 205, and recorded three deaths, one, that of J. T. Aspin, a very energetic member when the 'Flora of Halifax' was in preparation. At the lectures the average attendance was 86, or 104 including the exhibition. In natural history it was deplored that the keenness which formerly existed was not apparent. Miss Percy announced that, as Treasurer, she had a small balance in hand. The Chairman commented on the good work performed by members of the sections. The Society was sound and doing good work by its efforts to interest people in scientific subjects generally and by promoting sections for specialists. The election of officers resulted in Mr. H. Waterworth once more being the President. Eleven Vice-Presidents were chosen; Messrs. J. H. Lumb and H. E. Greenwood re-appointed Secretaries; Miss Percy, Treasurer; Mr. and Mrs. F. Barker, Lanternist and Librarian respectively; and Mr. C. S. Walker, Hon. Solicitor.

SCIENCE PROGRESS

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Editor - COLONEL SIR RONALD ROSS, K.C.B., F.R.S.

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WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

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NOTES AND COMMENTS.

'A LOST CONTINENT.'

It is astonishing that our morning papers can still find room for columns of rubbish such as the following :—' Locked in by the age-old ice fields and gigantic frozen bergs somewhere between Alaska and Siberia and the North Pole is a lost continent. It is the one remaining place on earth about which the world of to-day knows nothing—except that it exists, *says a New York newspaper*.* Yet of all places on earth there is none upon which the mind of science dwells with such eager curiosity, or whose exploration may mean so much to man's knowledge of his own history. For on that lost continent, there is good reason for belief, there are still living forms of life, both animal and vegetable, which have been wiped out for ages in all other parts of the earth. In its hidden valleys, protected by towering mountains and volcanic warmth, the dinosaurs, those monster lizards of a million years ago, may dwell. The mastodon and the hairy mammoth may walk with ponderous tread the floors of its forests; the pterodactyl, the enormous flying lizard, whose memory still comes down to us in the legends of dragons, may still beat the air with his bat-like wings. And in some such hidden and protected valley the creature that bridged the gap between the ape-like forms and man, the "missing link" itself, may still be alive. Or, at least, relics of him may still exist in such numbers and forms as to settle for ever the question of our evolution.'

THE MALES AND CADDIS GRIBS.

As a further instance of the vagaries of the press we reprint the following from the *Hull Daily Mail* of April 16th, as it appeared in that paper :—' A joint excursion of the members of the Hull Scientific and Field Naturalists' Club and of the Hull Boys' Natural History Club was held on Saturday, on the Humber Shore at Saltend Common, and along Hedon Creek. Mr. Lionel Flatt was the leader. Some of the pools in the common proved fairly rich, in freshwater forms of life, in spite of the evident pollution of the water through escape of oil. Swarms of "wrigglers," or larvae of gnats were seen. The water beetles known as colymbetes nuschs and agabus conspersus were abundant in both larval and adult stages. Several fine specimens of the great crested or warty newt (*melale cristata*) were captured, the males in this, the breeding season, being resplendent in colour and adorned with a deep serrated crest. Caddis grubs of several kinds, the larvae of *chironomus* (the plumed gnat), three-spined, ten-spined sticklebacks, water-boatmen of the genera

* These words are perhaps unnecessary !

corixa and notonecta and several large transparent shrimps were also found.'

INTRODUCTION OF TOBACCO.

Another paper of the same date entertains us with the following, the writer apparently giving credence to the fables about 'Danish' and 'Roman' tobacco pipes:—'The introduction of tobacco into this country is generally accredited to Sir Walter Raleigh in 1584, but in all probability it was known long before this, for there is a record that in the year 1784, a human skull was unearthed at Bannockstown, Kildare, holding between its teeth a short black pipe, and about the same time other similar pipes were found with human bones in stone coffins on the banks of the Liffey. These bones have been stated to be the remains of Danes who were killed in the tenth century when attacking the native Irish. It may be of interest to note that Savary, writing in 1723, states that tobacco was known to the Persians early in the fourteenth century, and they were supposed to obtain it from Egypt. Finally we have the statement of Ewlia Effendi that a pipe, retaining the smell of tobacco, was found when cutting through the wall of a house built in Constantinople before the birth of Mahomet.'

APRIL 1ST.

We also learn from the same source that 'An egg of a dark chocolate colour has been laid by a white Leghorn hen at Bilsington, Kent. Around the centre of the egg was a light coloured band with a rose-shaped ornamentation.' The date the egg was 'laid' is not given, but it was doubtless on the first day of last month.

FAITH.

From a report in the press for April 16th we learn that 'Mr. James Sheldrake, of Hornsea, water diviner and engineer, wrote to the Urban Council that there was an abundance of pure water to be found within a mile or so of the Hornsea waterworks. He offered to locate the water, put down a bore, and tap it. His conditions were that if he failed he should bear the expense himself, but if he succeeded the Council should pay him £300. The Urban Council, with only one dissentient, accepted this sporting offer, and Mr. Sheldrake began his task on April 2nd [a day late!] on a site in Bewholme Lane and within 1400 yards of the Council's Waterworks. He feels assured that there exists a stream of Yorkshire Wolds water, free from salt, at a depth of not more than 150 feet—a stream 17 yards wide, which he had touched for upwards of two miles! Up to Saturday, Mr. Sheldrake had found, boring through clay and gravel, chalk at 120 feet, and below this chalk pit he expects to find an abundance of water. So

much so that with a ten inch pipe Mr. Sheldrake feels he will be able to produce water at the rate of between 6,000 and 10,000 gallons per hour, which even at this rate of pumping would not be exhausted within 30 years. The rate of consumption in Hornsea, with its 4,000 population, is in normal times considerably less than the 5,000 gallons per hour which Mr. Sheldrake has contracted to bring up and pump direct into the Council's reservoir before claiming any payment from the Urban Council.' What the condition of the chalk must be to allow a 'stream seventeen yards wide' to exist, is beyond us.

THE PAGEANT OF NATURE.

Under this heading, Messrs. Cassell & Co. are issuing an entirely new work which will be completed in about thirty-six fortnightly parts, each to cost 1/3. Those already issued are wonderfully well illustrated from photographs and by means of coloured and monochrome plates, most of which are remarkable. Every aspect of natural history seems to be touched upon, and when complete the work will have over 2000 illustrations. Each part contains 72 pages, among the subjects discussed is 'The Awakening of Spring'; 'Migration of British Birds'; 'Sea-bird Breeding Haunts'; 'The Otter'; 'Moths'; 'Curiosities of Insect Life'; 'Awakening of Leaf Buds,' etc. The General Editor is Dr. P. Chalmers Mitchell, the Secretary of the Zoological Society of London.

HULL.

The Hull volume of the British Association has been issued some little time, but unfortunately it was not possible to bring it out during the year of the meeting, an event to which we still look forward. The cost of printing, etc., has resulted in many economies, but the Report contains about 540 pages, and may be looked upon as an excellent record of the scientific achievements at the Hull meeting, albeit many of the popular lectures are not recorded more than by name. In addition to the various Presidential Addresses and Reports on the state of science, the volume contains Transactions of the Sections; References to Publications of Communications to the Sections; Sectional Communications *in extenso*; Prof. P. Weiss' Remarks in Discussion on the Origin of Magnetism; Discussion on the Nitrogen Industry; Imperial Citizenship, by Rt. Hon. Lord Meston; Corresponding Societies Committee's Report; Conference of Delegates of Corresponding Societies; List of Papers, 1921, on Zoology, Botany and Prehistoric Archæology of the British Isles, by T. Sheppard; and an Index.

NEW VARIETIES OF BRITISH LEPIDOPTERA.

In *The Entomologist's Monthly Magazine* for April, Mr. G. T. Porritt describes five varieties of lepidoptera, very different from the type forms, which have hitherto not been differentiated by name, though the specimens have long been in his cabinet. They are *Bryophila muralis* var. *brunnea* n., from South Devon ; *Anchocelis pistacina* var. *alba* n., from near Paignton ; *Scopelosoma satellitia* var. *olivacea* n., from Doncaster and Huddersfield ; *Cosmia affinis* var. *morleyi* n. (named after our contributor, B. Morley), from Doncaster ; and *Polia flavocincta* var. *infuscata* n. from Huddersfield.

MUSEUMS AND ECONOMY.

Sir Henry H. Howorth, F.R.S., a past-president of the Museums Association, and for several years a Trustee of the British Museum, writing to *The Times* from a sick bed recently, states : ' During these latter years it has become more and more difficult for the great museums to compete against the millionaires, and especially the American collectors, with the consequence that the stream of exports of such objects increases daily. This has been the time chosen by the Government to cruelly and more than once to cut down the Parliamentary grant for purchases until it has become positively ridiculous. Not only so. As everybody knows, the value of our collections depends largely upon their being scientifically arranged and catalogued, and the catalogues have been accepted abroad and here as models of excellence. During these last years, and especially later, a paralysing hand has been laid upon the publication of these catalogues. A number of them have been hung up, with a serious loss to all students and the waste of excellent material waiting to be published.'

MUSEUM PUBLICATIONS.

' Every year there has been presented to Parliament a Blue-book containing an account of what has been done in the Museum, and a list with the description of all the objects added to the collection, with a special reference to the donors of different objects. This has been the only method by which the generosity could be acknowledged. This very interesting record, the size of an ordinary magazine, has actually been cut down to a dozen pages of jejune matter. Can imbecility be carried further? The excuse that the saving of a few thousand pounds upon work which benefited all sounds a poor pretence when during these same last years a great many thousands have been spent upon a new-fashioned museum, not meant to illustrate the origin and progress of human art, but for perpetuating the cruel memories of a savage war and to preserve specimens of ephemeral inventions. The prophecies that many of us made in regard to it have most of them

been fulfilled, but one thing has not failed—namely, the drain upon the resources alone available for the maintenance of the older museums, which ought to be the object of our solicitude.'

PLANT NAMES.*

Archdeacon Lindsay has written a delightful little book on plant names for the benefit of garden-lovers who know 'small Latin and less Greek.' To those who ask 'is it fair to the lovely little flowers to link them with these horrid names,' he replies that when one understands their meaning, these botanical names are extremely interesting and instructive. They tell him something about his plants he did not know before, and he loves them all the more for knowing it. After a brief account of the history and principles of plant naming, pronunciation, spelling and gender, he deals with the more familiar species most likely to be met with by the gardener. The meanings of many names are unknown, being lost in antiquity. Some are derived from their medicinal properties, real or supposed, and groups of names are dealt with according to their uses, place of origin, classical and commemorative names, likeness to animals, fancy, habitat, descriptive and the like, and there is a chapter on the meanings of specific names. On the vexed question of pronunciation, he enunciates the cheerful doctrine that it has always been a matter of popular usage. There is really no rule, and his advice is 'pronounce them in any way you like, preferably in the customary way.' It is just as correct to say, 'Centa'urea as Centaure'a, and instances a speaker in the House of Lords, who, in the course of a speech, said, 'Cu'rator.' A noble lord corrected him, and said it should be cura'tor. The speaker replied, 'I bow to the opinion of so eminent a sena'tor, and so eloquent an ora'tor.'

PREHISTORIC SEA BONES.

Under the above somewhat unusual heading, *The Daily Mirror* informs us that 'An examination of the bones trawled from the depths of the North Sea by the Grimsby trawler *Savaria* has led to the conclusion that they are part of the skull of an ichthyosaurus and date from the Mesozoic period. The specimen was small, being only 24 ft. long, but the excellent state of preservation of the bones is presumably due to them having lain buried for thousands of years until thrown upon the bed of the sea by some recent minor volcanic disturbance.' Another version is 'that it may be that of an ichthyosaurus (a marine reptile of the Mesozoic period, somewhat resembling a porpoise in form). If so, the specimen is an unusually small one, for calculations indicate that the

* By T. S. Lindsay. London: Sheldon Press, 93 pages, price 2/6 net.

body would have been about 24 ft. long, whereas the usual length was more than 30 ft. palæontologists believe.' We have not seen the skull, nor an illustration—but we imagine it will be 'very like a whale.'

WHALES SKULLS.

Since the above was in type, the editor of *The Hull News*,



at our suggestion, sent over to Grimsby and obtained the accompanying photograph of the sea monster (the one on the left!). It is certainly the skull of a whale,* such as is frequently brought into Hull by trawlers: in fact, a very similar example has since been landed at Hull and handed over to the Museum of Fisheries and Shipping there.

* Sir Sidney Harmer, of the British Museum (Natural History), kindly informs me that there is no doubt that the whale's skull illustrated above is that of a Lesser Rorqual. The figure is rather misleading, as an incomplete maxilla has been arranged in the middle line, so that it appears to be a part of the rostrum of the skull.

ORIGIN OF COAL.

We learn from a Yorkshire paper that 'The research conducted by Professor Barton Scammell, President of the Radium Institute at Dover on the analysis of lava from Mount Vesuvius, now being used as a fertiliser, has, the Professor states, led to the discovery that the layers of "bind," the mysterious substance found at the top and bottom of all coal seams, are identical in analysis with lava. The "bind" contains lime, iron, soda, magnesia, potash, and other elements required by plant life, and when made radioactive with solutions of radio-phosphate of potash, it absorbs nitrogen from the air and forms a perfect fertiliser. The mystery of the origin of coal is at last explained—the cellulose of the trees and vegetable matter has been carbonised by the hot lava forming "coal"—and sunk into the depths of the earth by disturbances of the earth's crust at a remote period of time. The use of this waste product will enrich the industries of mining and agriculture.' So that's that!

MORE DISCOVERIES.

Still more amazing discoveries are recorded in the press: this time made by an English explorer, though in America, according to the papers recently. 'Surrounded by scientists famous throughout the world, Mr. Mitchell Hedges calmly discussed the existence of a hitherto unknown race of people, described his reception by these people, who never before had looked upon a white man, then displayed to his hearers the tangible evidence of the truth of a story of scientific research far beyond the wildest invention of fiction. Piled high in a closely-guarded room are thousands of different objects, which, says the London *Evening Standard*, re-open all investigations into the civilisation of 10,000 years ago. Among them are squares of picture writings which, when the key is found, may give the world a new history of the early human migrations. Mummified remains of men and women living centuries ago, but whose descendants still live, prove the heretofore nebulous theory that America was first settled by the Chinese.'

JURASSIC ANIMALS LIVING.

'In another corner of the room there are relics which give proof that animals of the Jurassic period, thought to be extinct for millions of years, still live. Around the room hang more than a hundred "gods" of a people which has not advanced since its isolation 6000 to 10,000 years ago. When he set out two years ago to explore the wilds of Panama and to carry out research work in the Caribbean Sea, Mr. Mitchell Hedges little thought of the epoch-making discoveries that were to be his. Obtaining legendary clues to a race of people which even the old Spanish adventurers were unable to approach owing to

the hostility of the Indians, he sailed from Colon, Panama, voyaged 100 miles in his 30 ton yacht, *Kora*, and eventually entered an opening in the reefs. Then, after threading 150 miles of coral reefs and islands, at last he penetrated into the hinterland of Panama. There, in the Chucunaque country, he came upon a race of Indians who hitherto had never seen a white man or woman. They saw both last year, for Mr Mitchell Hedges was accompanied on his historic trip by Lady Richmond Brown—to whose valuable help he pays grateful tribute.' We suppose we ought to believe all this, but it is difficult !

—: o :—

Geology, by **C. I. Gardiner**. London : John Murray, x.+138 pp., 3/6 net. By the aid of numerous clear diagrams, good type, good paper, and careful arrangement of headings and sub-headings, a general treatise on Geology has been produced which will be of service to student and teacher alike. At the conclusion of each chapter, questions are given which will be useful to students using the book.

Civil Engineering Geology, by **Cyril S. Fox**. London : Crosby, Lockwood & Son, xvi.+144 pp., 18/- net. This volume is issued by a member of the Geological Survey of India, and is largely written for use in that Empire, which has also produced a great number of the illustrations. There are practical hints on quarrying, tunnelling, boring for water, reservoirs ; and the book concludes with accounts of the principal rock groups, common rock-forming minerals, the physical properties of rocks, and choice of materials.

A miserable thin pamphlet of 16 pages, which includes 5 $\frac{1}{4}$ pages devoted to the Natural History Museum, is entitled **Annual Report of the General Progress of the Museum and of the British Museum (Natural History) for the year 1921 : with a Return of the number of persons admitted to the Museums, and a statement of the Principal Objects added to the Collection**. It is sold at one shilling, has not a cover, and while it certainly does keep us acquainted with the fact that this Institution exists, and is doing good work, the publication is unworthy of it.

Messrs. Hutchinson have issued the first parts of a publication entitled **Animals of All Countries**, which is stated to be costing £75,000 to produce. Part I. contains 48 pages, on each of which an illustration appears (sometimes two), and the work is to be completed in about 48 fortnightly parts. We notice among the specialists contributing, F. F. Bather (? F. A. Bather), E. G. Boulenger, T. W. Calman, M. A. C. Hinton, W. P. Pycraft, E. Step, and others well known to our readers. Part I. includes a general introduction, with some extraordinary illustrations, and a chapter on Primates. There is a magnificently coloured illustration of a Gorilla, and another of an African Lion and Lioness, in this issue.

A Little Book on Water Supply, by **W. Garnett**. London : Cambridge University Press, xv.+144 pp., 6/6 net. This is an excellent production, the chapters are well written, well thought out, well illustrated, and the author has been able to bring forward many fascinating stories of early difficulties in connection with water supply. Dr. Garnett traces its history from the earliest times. By the aid of many clear illustrations he tells much of interest in connexion with the former difficulty of supplying London with fresh-water. The only thing we do not like about the volume is its title. 'A little book' might quite as easily be added to the title of most of the volumes, on any subject, which have appeared recently.

T. SHEPPARD, M.Sc., F.G.S.

ONE of the most extraordinary newspaper 'stunts' in recent years has been the method adopted by Mr. Leslie Armstrong, of Sheffield, in endeavouring to convince the world that the two bone harpoons which he exhibited at Hull are genuine, and that the opinion expressed by the present writer to the effect that the harpoons are forgeries, has been proved to be wrong. Mr. Armstrong alleged that two committees have proved conclusively that the harpoons are twelve thousand years old, whereas the committees have proved nothing of the sort, and, in fact, could not do so.

In *Man* for April is a report which contains a summary of some arguments put forward by myself.*

My paper was sent to *Man* immediately after the appearance therein of Mr. Armstrong's paper in September last, but apparently that journal cannot find space for more than Mr. Armstrong's views. After keeping the MS. until the middle of April, an alleged 'summary' of this 'written statement' appears, which summary is misleading. However, in order that it might be seen precisely what my notes are which are said to have been summarised in *Man*, they are given herewith:—

'May I utter a protest in reference to Mr. Armstrong's paper (*Man*, September, pp. 130-131), on the alleged Maglemose remains in East Yorkshire. Some time ago Mr. Armstrong informed me that he was preparing some notes on the two harpoons, and, on the 28th June, 1922, I gave him more than a hint as to what he had to contend with.

'Having given this warning, I think it is most unfair to place the "discovery" on record as though it were genuine, and subsequently for him to read a lengthy paper on the subject to Section H. (Anthropology) at the Hull Meeting of the British Association. This latter paper dealt with the immigration of the so-called Maglemose people to Holderness at a period much earlier than for which there is the slightest shred of evidence. That paper was unaccompanied by a single expression of doubt as to the authenticity of the objects.

'Had Mr. Armstrong not been warned there might have been some excuse for the pages in *Man*, and the time of Section H. being occupied at such length; as it is, I have no hesitation in placing my protest on record and in giving my reasons for deprecating the publication of papers of apparent great archaeological value on such slender evidence.

* One statement that I am said to have made, namely 'The Pottery from the pits in which the harpoons were found is Roman or Iron Age,' I never made at all; as, of course, the pits have nothing to do with the harpoons in any way, and were merely mentioned in Mr. Armstrong's original paper read at Hull, to prove in some way the genuineness of the harpoons. This was my only reason for stating that the pits had no connection with the harpoons and were indeed of later date.

'There have been far too many archæological "mare's nests" in recent years, and time after time it has been necessary

FIG. I.



FIG. II.



FIG. I.—Bone harpoon found in Denmark. From Lubbock's '*Prehistoric Times*,' 1872.

FIG. II.—Photograph showing two views of the harpoon in the possession of Mr. Morfitt. (Photo: Watson).

to correct (sometimes even by the authors themselves) records of much apparent importance ; in many cases—for example,

the notorious Ipswich skeleton—the mere correction is not sufficient, as the details of the original discovery find their way into text-books, where it is impossible later to put the matter right.

‘ Mr. Armstrong’s elaborate theories are based entirely upon the alleged discovery of two harpoons similar in type to some found at Maglemose in 1903. If these harpoons are proved to be forgeries, then his whole structure of theories falls to the ground, in addition to which the difficulty caused by the appearance of such early culture, in the Holderness peat deposits, disappears.

‘ In order, therefore, to put the matter to the test, and to urge the necessity for a full and impartial enquiry to be made, I am going to be bold enough to say that, in my opinion, the harpoons are not as old as is Mr. Armstrong. Mr. O. G. S. Crawford, speaking after Mr. Armstrong at Hull, opined that the harpoons were genuine as regards age, but he could not, of course, confirm or otherwise the details of their actual discovery in our peat. He stated, however, that a certain stone axe, found in the same district, helped to prove their great age. I fail to see the force of this argument, as the stone axe has no more bearing upon the date of the harpoons than has a threepenny-piece found in the same area, in fact, in my opinion, the latter is more likely to date them !

‘ One harpoon is said to have been found in 1903, and the other in 1915 (? 1905). One, according to Mr. Armstrong’s paper in *Man*, was found “ by a workman ” beneath twelve feet of peat at the Hornsea Gasworks. The other was found under five feet of peat on the beach at Skipsea, by Mr. B. Morfitt. Neither was accompanied by any other relic. Both were found within easy reach of Atwick, where Mr. Morfitt lives, they are both in his collection, and have been for about twenty years.

‘ No other find of the kind is recorded in the area, though the late Clement Reid, T. Boynton, and members of the Hull Geological Society, and dozens of workers have been watching the sections on the coast and excavations for docks where peat has been exposed.

‘ These facts alone are important.

‘ Similarly, I have known of the finds for some years (I fancy before 1903), and I have previously had the pleasure of recording some of Mr. Morfitt’s geological discoveries. I am not, as a rule, backward in publishing particulars of important archæological finds in East Yorkshire. I have photographs and full particulars of these harpoons in my possession, and have had for years ; therefore must have had some reason for not publishing the details. The harpoons show a finish, a sharpness, and a smoothness, remarkable if they are of the

age suggested. Professor P. F. Kendall, who spoke at Hull, pointed out that objects buried under peat usually showed signs of corrosion. These harpoons do not.

' On being asked where they actually were, Mr. Armstrong produced a box, carefully packed up and fastened. If they were above suspicion, why were they not handed round for inspection? If they were genuine, why not welcome every possible investigation?

' Presumably, in order to support his arguments, Mr. Armstrong read the late Canon Greenwell's article in *Man* some time ago dealing with the so-called *pit* dwellings in Holderness. Why these were ever called "pit" dwellings it is difficult to conceive, as they were shallow saucer-like depressions.

' The late Col. Haworth-Booth gave me some pieces of pottery from these "pits." They were late Roman. He also permitted me to excavate some for myself, and all I could find were a few burnt stones, bones, and pieces of Roman pottery. Mr. Crawford, who has seen the pottery from these "pits," states it is unquestionably of the Iron Age.

' More recently I have had given to me a fragment of black pottery from one of these pits, which the owner himself excavated. The authorities at the British Museum consider this to be part of a Wedgwood teapot. All this make one wonder why the "pits" were considered to be pre-Neolithic, and how they can in any way have any bearing upon the Maglemose harpoons.

' After my remarks, somewhat on the lines of the above, at the Hull meeting, Mr. Morfitt stated that he had found the harpoons, or one of them. He explained that as an "explorer" he had armed himself with a "pricker" of iron, with which he had probed the peat at Skipsea to a depth for *fourteen* feet (Mr. Armstrong said *five*). As this was on the shore it means that several feet—say ten—had already been denuded by coast erosion, a total depth of twenty-four feet!

' When he had inserted his iron pricker fourteen feet in the peat he felt something with the point—dug down, *et voilà*—there was the harpoon!

' In the first place, speaking as a geologist, I have still to learn of a bed of peat on the East Coast of Yorkshire which is a quarter of the thickness of this one.

' Also, if the pricker is able to extend fourteen feet in the peat, it would be interesting to see it, presumably it would be at least sixteen feet in length? Where is it? How was Mr. Morfitt able to press it fourteen feet in the peat? How did he dig a fourteen feet hole and *keep the water out*? As a rule at a foot's depth on our east coast and we are in water. To dig fourteen feet down in peat and then find one of two known

Maglemose harpoons, without the aid of a diving dress, is a performance we should much like to have explained.

‘ Similarly, in his paper in *Man*, Mr. Armstrong distinctly states that the harpoon was found in lacustrine *silt* beneath the peat. This is a most important point in discussing the age of the harpoons. On being questioned at Hull, Mr. Morfitt, who found it (and who ought to know), stated that he got the harpoon out of *Boulder-clay* at the base of the peat. I suppose we cannot doubt what Mr. Morfitt states? Why has Mr. Armstrong said silt?

‘ To show that the Holderness Maglemosians were lake dwellers, Mr. Armstrong stated, presumably on Mr. Morfitt’s observation, that there were holes in this silt (? boulder clay) beneath the peat in which pieces of peat had been thrust. On the strength of these peat-filled hollows we learn that the Maglemosians were occupiers of lake-habitations, had punts, or other craft, the poles of which had made these holes beneath the peat which none but Mr. Morfitt had seen.

‘ And this is the sort of stuff that Section H. (Anthropology) is fed upon !’

The following report of the committee appointed by the Royal Anthropological Institute on the authenticity of the bone harpoons is given in *Man* for April :—

‘ The Committee met at the offices of the Royal Anthropological Institute, 50 Great Russell Street, W.C., on Wednesday 6th December, at 5 p.m.

‘ In addition to the members of the Committee there were present, Mr. A. Leslie Armstrong, Mr. E. N. Fallaize, Mr. G. A. Garfitt, Mr. G. W. Lamplugh, F.R.S., Mr. H. J. E. Peake, Mr. T. Sheppard, and Mr. Hazzledine Warren.

‘ The evidence before the Committee was as follows :—

‘ I. An article in *Man*, September, 1922, No. 75, describing and figuring the harpoons and stating the alleged circumstances of the discovery.

‘ II. A written statement by Mr. T. Sheppard giving his grounds for questioning the authenticity of the harpoons, substantially in accordance with the remarks made by him in the discussion which took place when the harpoons were exhibited in Section H., at the Hull meeting of the British Association in September last.

‘ Mr. Sheppard supplemented his written statement by a verbal statement to the Committee at this meeting.

‘ III. A further note by Mr. Armstrong embodying (a) a letter from Sir. W. Boyd Dawkins, F.R.S., dated 20th September, 1922, in which he stated (1) that he had known the harpoons since the time of their discovery, and (2) that one of the harpoons had been broken in the post when he returned it to Mr. Morfitt. (b) A report by Dr. A. C. Haddon, F.R.S., Mr. Miles,

C. Burkitt, and Professor J. E. Marr, F.R.S., dated 30th September, 1922, giving the results of a detailed comparison of the Holderness harpoons with four harpoons from Kunda, Esthonia, now in the Ethnographical Museum, Cambridge.

'The Committee also had before it the two harpoons and two portions of the femur of an elk said to have been found at the same level as the harpoons found at Skipsea Withow in 1903.

'The Committee reports as follows:—

'In general we see no evidence in the objects themselves that is conclusively against their genuineness.

'A curious feature is that the workmanship of the barbs in the two harpoons is so similar as to point to their being the work of the same individual, though found 4* miles apart.

'It is worthy of remark that at the time of the earlier find was made there was no available example of a Maglemose harpoon.

'Mr. Sheppard appears to have had strong grounds for doubting the authenticity of the harpoons, but the evidence on which his judgment is based is no longer verifiable.

(Signed) C. HERCULES READ.

A. SMITH WOODWARD.

PERCY F. KENDALL.

'The Report was presented to the Council of the Royal Anthropological Institute and adopted at a meeting held on January 16th.'

The Editor of *Man* kindly allows me to print this and reproduce two of the illustrations of the Holderness harpoons herewith.

It will be seen from the findings of this committee precisely how the matter stands, but a special article on the subject appearing in *The Times*, for April 17th, which we have good reason to believe is by Mr. Leslie Armstrong, distinctly states that two committees have sat upon these relics and are satisfied as to their authenticity.

Unfortunately the Press Association, in summarising this prejudiced report, gave it forth to the various newspapers in the country that the harpoons had been proved to be genuine, whereas, of course, this is not the case. So far has Mr. Armstrong's imagination run riot that in a personal interview given to a Sheffield paper, he makes the statement that 'the whole of the members of the British Association were in agreement with him except Mr. T. Sheppard, of Hull, who contended the harpoons were modern forgeries.' Not half-a-dozen members expressed an opinion, and only a very small proportion of the members heard the address at all.

* This should be 5½ miles.

However, *The Yorkshire Post* gave a fair summary of the findings of the committee, and permitted me to make observations thereon. This, together with subsequent correspondence, is given herewith, and will enable our readers to see that the question is by no means settled, and in the interests of truth it is hoped that Professor Kendall's suggestion, that the matter be reconsidered, will be acted upon.

From *The Yorkshire Post*, April 19th.

' Mr. T. Sheppard, in an interview with our Hull representative, said that the result of the inquiry was by no means to establish the authenticity of the alleged harpoons. "At the special inquiry held in London, at which I happened to be present," he said, "at least one of those present considered both the harpoons were forgeries. Other persons considered that one might be, and some could not express a definite opinion. The fact that it could not be found from the objects themselves that they were 'fakes' is not proof of their genuineness. They have been made from bone of the red deer taken from the peat and already 'antique' and seasoned with age. They had a glossy appearance totally foreign to anything from the peat in this district, and I was able to show that the facts of the discovery, as outlined by Mr. Armstrong, the nature of the deposits in which they were obtained, and the depth from the surface at which they were found, differ from the evidence given by Mr. Morfitt, Jun., their discoverer." The particular harpoon, which was said to have been found in 1905, was certainly exhibited in Hull before that date, and in fact the whole of the evidence relating to their discovery varies as frequently as it is repeated. This does not prove, of course, that they were forgeries, but it makes us accept what should be scientific evidence with hesitation. An illustration similar to the larger harpoon was available long before the discovery was made. The late Lord Avebury, in a well-known volume, illustrated one such implement years ago. One of the findings by the Special Committee is particularly significant. They said: 'The workmanship of the barbs in the two harpoons is so similar as to point to their being the work of the same individual, though found four miles apart.' Are we expected to believe that in 10,000 B.C., one man made these harpoons and lost one in silt under peat at Hornsea, and that he lost the other in boulder clay under peat at Skipsea, several miles away; that both these harpoons rested undisturbed there for 12,000 years; and then within a relatively few months of each other both were obtained—and by one individual? Such a series of coincidences is surely a little too much to swallow by the most credulous of us.

"The story of the discovery of one of the harpoons as related to members of the British Association by the discoverer himself must," added Mr. Sheppard, "not be forgotten. He was pricking the peat on the coast with an iron rod, and at a depth of 12 feet felt something with his rod. He dug down, and—*voilà!*—there was the harpoon. It is not explained how he kept the water out while he made the excavation in the water-logged peat, which is, moreover, never anything like 12 feet thick in the district. I would like to make it clear that I believe that Mr. William Morfitt, the veteran antiquary at Atwick, really believes that the finds are genuine, but the actual discoveries were not made by him."

The Yorkshire Post, April 21st.

' Mr. A. Leslie Armstrong, of Sheffield, writes to us:—Mr. Sheppard's comments upon the bone harpoons from Holderness, referred to in your article of Wednesday, are substantially those he made at the Hull meeting of the British Association, and later submitted in writing to the London Committee of investigation. As they are now made to a wider public,

an answer is desirable in the interests of Yorkshire archæology. Mr. Sheppard's assertion that at the meeting of the London Committee one person present considered both harpoons to be forgeries needs no comment—in view of Mr. Sheppard's presence ! I, too, happened to be there, but heard no doubts expressed respecting either, except by the "plaintiff." The glossy appearance of the relics is due to their treatment with hot glue, for purposes of preservation—a common practice, though not the most desirable. The same appearance was seen upon bones of elk, beneath which the Skipsea harpoon was found, as these had received the same treatment.

'The most reliable facts relative to the finding of the harpoon, it will, I think, be granted, are, the written statements in the log-books of Mr. W. Morfitt. In these books a careful daily record has been kept of observations, and of finds made over a long series of years. The facts, as given by me, were personally abstracted from those books. The entries occur in proper sequence and chronological order, and were set down at the time of each discovery, when the facts were fresh in memory.

'It was specifically stated by the official members of the Committee that the resemblance in workmanship between the two harpoons, which is referred to in their report, did not imply that they were not considered genuine, but was an interesting scientific fact worthy of record. Harpoon making, as instanced by a member of the Committee, required special skill, and it is more than likely that the harpoons of the whole community, which could not be a large one, were the work of one expert individual. This fact has long been recognised in regard to palæolithic implements from the gravel pits, notably those of Dovercourt, where the similarity in technique is so marked between implements widely scattered that only one conclusion is considered possible—that they are the work of the same individual—a specialist. If there were specialised craftsmen in Chellean times, why not in Maglemosian.

'The most significant point in the report is the statement that no harpoon was available when the smaller one (the Skipsea example) was found—a statement not to be obscured by references to the Avebury illustrations. That illustration was before the Committee, and bears only a general resemblance to the larger of the two harpoons—that from Hornsea—and none whatever to the smaller example to which the Committee refers. No illustration of a harpoon similar to the Skipsea one has ever been published in this country until the appearance of the current issue of "Man." * The only known examples are those figured there from Kunda, in the Baltic area, and now at Cambridge. Two of these Kunda harpoons are illustrated to the same scale and side by side with the Skipsea harpoon, found personally by Mr. Morfitt, jun., The resemblance in every detail of form, technique, and general character is unquestionable. The Kunda harpoons were not in England when the Morfitt find was made. Therefore, if that is a "fake" then it is the most wonderful of all fakes, and the work of a hand of superhuman prescience, for it reproduces faithfully the details and certain specialised features exclusive to harpoons of Maglemose type, at a time when the only examples known had been seen only by a small circle of Danish archæologists.

'In Mr. Morfitt's statement at Hull, it was not, and never has been, claimed that he "thrust his iron pricker into the peat and felt the harpoon." He was doing what he had done scores of times before, searching for the bones of animals buried in the peat. What his rod touched was the skeleton of an elk—a very different matter. In removing the elk the harpoon was found beneath it, lying in the silt of the old lake bed, and this was a chance find. It was neither stated, nor intended to be implied, that a hole 12 feet deep had been dug to recover the harpoon. The bed of peat is upon

* Mr. Armstrong himself published an illustration of it in September, 1922 !—ED.

the sea coast, and was at that point greatly eroded by the sea. The harpoon was found beneath what remained of this eroded peat bed upon the beach. Mr. Sheppard has himself estimated the depth of the eroded portion at 10 feet. Mr. Morfitt was asked what depth of peat had covered the harpoon,* and said "about 12 feet," which, allowing for erosion, is probably not far out.

'Finally, may I call attention to two further important and independent opinions. Sir William Boyd Dawkins, F.R.S.—no mean authority—states that he has known of the harpoons ever since their discovery, and considers them "undoubtedly genuine," and that the charge that they are forgeries is "absolutely without foundation." The Abbe Breuil, of Paris, than whom there is no one more conversant with harpoons of this type, has seen and handled them, considers them to be genuine, of Maglemose age and type, and compares the Hornsea harpoon with one found under peat near Bethune, which it exactly resembles.

'In view of the considered opinions of these eight eminent scientists, who had before them all Mr. Sheppard's objections, and also the relics themselves, I may safely leave the public to decide as to whether the harpoons are genuine antiquities or not.'

The Yorkshire Post, April 24th.

'SIR.—I have hitherto refrained from intervention in the piquant controversy regarding these objects, being quite content to leave it in the hands of the two very competent protagonists. There is, however, a passage in Mr. Leslie Armstrong's communication in your issue of this date which is so astonishing and so disconcerting that I feel constrained to offer some comment, since it not only presents the matter in a new light, but may possibly affect judgments on other and wider issues. It is this. Mr. Armstrong states that "the most reliable facts relative to the finding of the harpoons, it will, I think, be granted, are the written statements in the log-books of Mr. Morfitt." He goes on to say that: "In these books a careful daily record has been kept of observations and of finds over a long series of years. The facts, as given by me, were personally abstrated from those books. The entries occur in proper sequence and chronological order, and were set down at the time of each discovery, when the facts were fresh in memory."

'As a member of the committee of three appointed by the Royal Anthropological Institute to investigate the evidence relating to the authenticity of the harpoons and the circumstances of their acquisition by their owner, I feel entitled to ask why "the most reliable facts" were never hinted at when Mr. Armstrong met the committee, and why the existence of the log-books, which would, or might, have set beyond doubt the vital question of the dates of the alleged discoveries, was not made known to the committee.

'Whether this unfortunate reticence was by mere inadvertence, or whether it was imposed upon Mr. Armstrong by the owner of the log-books, or to whatever cause it may be ascribed, I do not think the matter can be allowed to rest here, and I think the fires of controversy should be banked until a further investigation, either by the original committee or by some other body, has been made into all the available evidence, including the testimony of the workman who is stated to have found the harpoon at the Hornsea Gasworks.—Yours, etc., PERCY F. KENDALL, Moor Allerton, Leeds, *April 21st.*

'SIR,—There are one or two points in Mr. Armstrong's "defence" which call for reply. It can be proved that the books in which careful

* What he was asked was 'at what depth did you find the harpoon.' I have this on the authority of the person who asked the question, and we all (but Mr. Armstrong) heard it.

records are said to have been made, and used so much by Mr. Armstrong, are three years wrong as regards the date the large harpoon was found. In other words, the specimen was exhibited in Hull long before these valuable books recorded the discovery.

'With reference to the "resemblance in workmanship" in the two harpoons, the Committee went further than this; it definitely stated that both had been made by one individual. Mr. Morfitt, jun., at Hull, told us distinctly (as was reported in the Press at the time), that the Skipsea harpoon was found in boulder clay, and therefore presumably is of glacial age, whereas the Hornsea harpoon was in silt, of post-glacial date. If, as the Committee assure us, both were made by the same individual, this Maglemosian must have lived some thousands of years, to have dropped one in glacial clay and one in silt. After all, we must believe Mr. Morfitt, jun., the discoverer, in preference to Mr. Armstrong, who has to rely upon the MSS. at Atwick.

'There is no question that Mr. Morfitt distinctly stated at Hull that he inserted his iron rod 12 feet* into the peat and then felt the harpoon, then dug down 12 feet and obtained it. The Press reports confirm this. He made a similar statement to me years ago, as he has done to dozens of visitors to "The Mare's Nest" (Mr. Morfitt's own name for his cottage at Atwick), the only difference being that sometimes it was a foot or two deeper. It is no use Mr. Armstrong telling us what Mr. Morfitt meant; we know what he said, and must believe Mr. Morfitt.

'Mr. Armstrong states that no illustrations similar to the Holderness harpoons had appeared before their discovery. On page 105 of Lubbock's "Prehistoric Times," 1872 edition, is an ancient bone harpoon from Denmark, almost identical with the larger one. On the page facing this is the figure of a bone implement similar to the smaller harpoon, except that it has no teeth. An illustration not so far away from the smaller harpoon occurs in Munro's "Lake Dwellings of Europe," published in 1890. Mr. Morfitt, I know, had seen both these books before the Holderness harpoons were found.

'The smooth and polished surface of the harpoon in no way resembles that on the bones exhibited in London, and is due, in my opinion, to the action of a pen-knife. At Hull an expert told us that he could distinctly see steel file markings on the harpoons. Are they there yet?

'We have scores of ancient bone implements from this district in our collection, none so old as these are supposed to be, but all show pittings and other signs of weathering. Prof. Kendall informed us at Hull that articles from the peat usually showed signs of corrosion. These harpoons show none.

'Mr. Armstrong's array of experts, most of whom had previously committed themselves by accepting the objects as genuine, does not affect the question. Years ago another "explorer," known as Flint Jack, deceived most of the directors of museums and antiquaries in the country by his "pre-historic" implements and pottery. If it had not been for the unfortunate fact that he admitted he had made the objects, and actually gave a public demonstration of his methods, those antiquaries would doubtless have contended that the relics were genuine, rather than admit they had been duped.

'I am with Mr. Armstrong in desiring the public to decide as to whether the harpoons are genuine or not. What I do object to is that Mr. Armstrong should advise the public that the London Committee proved that they were genuine. The Committee admitted it could not prove the harpoons were forgeries, but what is all the most sanguine opponent could desire—they were most definite that both were the handiwork of one and the same individual.—T. SHEPPARD.

* This should be 14 feet.—ED.

Mr. J. W. Stather writes :—

‘ Is it not a fact that one of the experts who has expressed his opinion that the Holderness Harpoons are genuine, is the same expert who, a little while ago, in company with Professor Sollas, discovered some paintings in a cave in the South of England, which were considered to be of the Cave Man period, and were illustrated and described in the press at the time as the oldest drawings ever found in the British Islands? And is it not a fact that a fisherman explained the appearance of these red markings on the cave wall as due to the circumstance that a few months previously he had cleaned a paint brush by wiping it on the wall; also that this same gentleman figured the Holderness Harpoons in a work published some years ago, and it is hardly likely now he will admit he has made still another blunder?’

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Among many matters the Spring issue of ‘ The Geographical Teacher ’ contains ‘ The Influence of Geographical Factors on the Agricultural Activities of a Population,’ by Sir John Russell; ‘ Group Work in Geography,’ by Miss Dorothy Wilford; and ‘ Types and Materials of Houses in England,’ by H. Batsford.

The Transactions, etc., of the Perthshire Society of Natural Science (Vol. VII., pt. 4) are on quite the right lines. J. R. Matthews has a well-illustrated paper on ‘ The Distribution of the Perthshire Flora; J. Menzies has a notice of Charles M’Intosh; and Henry Coates contributes a remarkably good Monograph on ‘ The Land and Freshwater Mollusca of Perthshire,’ with bibliography.

The Seventy-first Report of the Marlborough College Natural History Society contains a series of notes and articles as useful as it is varied. A. G. Lowndes writes on ‘ Arran Pitchstones ’ (with plates), J. B. Auden on ‘ Lugar,’ H. C. Brentnall on ‘ Saxon Battlefields,’ and on ‘ Castrum Merlebergæ ’; there are full reports of the Entomological, Botanical, Ornithological, Archæological and Astronomical Sections, and numerous short notes.

Part 3 of Vol. VIII. of ‘ The British Mycological Society Transactions ’ (pp. 113-192, 7/6), is full of valuable monographs, as usual, F. T. Brooks and C. G. Hansford write on ‘ Mould Growths upon Cold-store Meat; K. C. Mehta gives ‘ Observations and Experiments on Cereal Rusts in the neighbourhood of Cambridge; ‘ The Literature and Classification of the Hysteriales,’ by G. R. Bisby; ‘ A Die-Back in Sussex,’ by M. L. Alcock, and a note of W. B. Allen, by Carleton Rea.

At a recent meeting of the Linnean Society, Mr. W. R. Sherrin showed a small volume containing small specimens of the entire moss-flora of Britain, as a *memoria technica*; also a similar volume, with species and varieties of *Sphagnum*. Dr. A. B. Rendle and Mr. H. N. Dixon spoke on these exhibits, the latter producing a copy of W. G. MacIvor’s ‘ *Hepaticæ Britannicæ*; or Pocket Herbarium of British Hepaticæ,’ New Brentford, 1847, containing 18 folios of specimens. The copy shown was remarkable for an inserted sheet of the alga *Thorea ramosissima* Bory; possibly the only British specimen extant.

An exhibition illustrating modern methods of teaching geography, arranged by the local branch of the Geographical Association under the supervision of Mr. A. Charlesworth, at the Hull Municipal Museum, was opened by the President of the Museums Association, Mr. T. Sheppard, who gave an address on local geography, to an audience consisting largely of teachers. The collection included models, plans and drawings prepared by the scholars from over forty local schools, from infants departments to the colleges. The exhibition was open a fortnight, during which the scholars had an opportunity of examining it. Many of the local manufacturing firms sent samples of their raw materials, with details of their source.

FIELD NOTES.

Canadian Squirrel near Harrogate.—A Canadian Squirrel was caught in a rabbit trap at Plumpton, near Harrogate, on January 9th. Possibly he had wandered from Copgrove, the nearest point where these animals have been introduced.—R. FORTUNE.

Semi-albino Rook in Yorkshire.—Last October, and again on 4th March, I saw at Apperley Bridge a parti-plumaged Rook. With closed wings, a narrow, white longitudinal stripe only was visible; but in flight the whole of the secondaries were apparently pure white, giving the bird a striking appearance.—JASPER ATKINSON.

Montagu's Harrier near Whitby.—An immature Montagu's Harrier was shot at Normanby, near Whitby, in the summer of 1920. The skin, which was preserved and set up, has recently been examined by Mr. W. J. Clarke, who is satisfied as to its identity. The specimen has been obtained by the Whitby Literary and Philosophical Society for the Museum.—F. SNOWDON.

Mollusca at Austwick, Yorkshire.—On the occasion of the recent Bryological Section Meeting at Austwick, the following Mollusca were observed: Sulber, near Austwick, *Succinea putris*, *Pyramidula rotundata*, *Clausilia cravenensis*. Norber, near Austwick, *H. rufescens* and var. *minor*, *Zua lubrica*, *Vitrina pellucida*, *Hyalinia nitidula*, *H. fulva*, *Pupa umbilicata*, *Pyramidula rupestris*, *Clausilia bidentata*, *Balea perversa* and var. *edentula*, *Limnaea peregra*, *Pisidium pusillum*, *P. pulchellum*. Kirby Lonsdale, *Neritina fluviatilis*, *Ancylus fluviatilis*, *L. peregra*. Austwick Moss, *Hygromia rufescens*, *Ancylus fluviatilis*, *Pyramidula rotundata*, *Limnaea peregra*, *Hyalinia cellaria*, *Pisidium fontinale*, *Pisidium pusillum*. They have been verified by Mr. John W. Taylor.—GREEVZ FYSHER.

Sheep and Early Man in Britain.—In his article with the above title (*The Naturalist*, 1923, p. 135) Mr. H. E. Forrest has apparently overlooked relevant and important evidence. He suggests that sheep did not occur in Britain in the Neolithic Age, without apparently making enquiry into the evidence from Scotland, where deposits of Azilian, Neolithic and later ages have been excavated and their contents placed on record in easily accessible journals. The Scottish records suggest that sheep were introduced after Azilian and early Neolithic times, and before the end of Neolithic times, and the evidence for this conclusion will be found in brief in the account of the appearance of domestic animals in Scotland in my 'Influence of Man on Animal Life in Scotland,' 1920, p. 30, and in the accounts there of the early Scottish breeds of sheep and their historical significance.—JAMES RITCHIE.

THE MITES OF YORKSHIRE.

WM. FALCONER, F.E.S.
Slaithwaite, Huddersfield.

THE list given below completes the enumeration of the arachnid faunal of the county as far as now known, but in the present instance not only are the records of the number, occurrence and distribution of the various species much more incomplete than in the other orders,* but there is also, it will be noticed, a dearth of information in other directions, due in a measure to the fact that mites have been so little studied in this country, British students being, as is too often the case, too largely dependent on foreign authorities and literature. The species which have been found to be of economic importance or carriers of disease have naturally come into greater prominence and been given close attention. Of the others, not so distinguished, new forms are being constantly met with, showing that there is a rich field still to be explored.

Many mites are large enough to be collected in the field by the ordinary methods, but a great number of others are too minute to be thus dealt with, and can therefore be altogether overlooked. The material expected to contain them should be carried home and the mites sifted from it by means of a specially devised apparatus ; but this is not indispensable, as a home-made inexpensive appliance may very well be substituted for it. Methylated spirit by itself is too harsh a medium for preserving the softer kinds (*e.g.*, Hydrachnidæ, Thrombidiidæ), as it causes the body to shrink, the skin to wrinkle and the colour to be discharged. Much more satisfactory results are obtained by the use of one or the other of the following formulæ, the mites to be put in alive :—

- (a) 10 parts glycerine,
10 parts distilled water,
3 parts citric acid in solution.
- (b) equal parts of methylated spirit (industrial), distilled water and glycerine.

There are no very old mite records for the county, the earliest being those noted by Messrs. Michael, Soar, Pearce, Nuttall and Warburton,† but only to the extent of some half-dozen species definitely so localised ; and Dr. George‡ has more recently in *The Naturalist* furnished four others. During the last few years, the Rev. J. E. Hull has thoroughly revised the Oribatidæ, Gamasidæ and Thrombidiidæ, and cleared away much ambiguity and confusion of identity and nomenclature amongst the British species, and has also described in various

* The Harvestmen and False-scorpions, *The Naturalist*, March, April, May and June, 1916 ; the Spiders, from June, 1918, to December, 1922.

† See Bibliography, p. 182.

publications a considerable number of new forms, either of his own collecting or that of interested workers, who have sent him either specimens or material. The Yorkshire species of the three families named have been submitted to him, and it is to his unstinted assistance that the list of these is as full and accurate as it is. He has also communicated the particulars of such as have not passed through my own hands, as well as given other information.

With respect to the water mites, I am altogether indebted to Mr. C. D. Soar and the Rev. R. A. Taylor. Mr. Soar very kindly supplied the collated records of the eight county collections, which have passed through his hands at various times. Some were made by himself in V.C. 62 in 1901, in V.C. 63. Sheffield, in 1905, and in V.C. 63 and 64, Bradford, in 1906; others by Mr. Taylor in V.C. 62, Scarborough district, in 1912-13. I have entered the records as set down by Mr. Soar, but added his initials, with the exception of Mr. Taylor's gatherings, the particulars of which I have transcribed from a copy of a list left by him with the Scarborough Field Naturalists' Society, courteously supplied by its Hon. Secretary, Mr. G. B. Walsh. A small collection afterwards submitted by myself contained four species new to the county, V.C. 61, two species, T. Stainforth, 1915, and V.C. 63, two species, Captain Corbett, 1916.

For the gall mites, with the exception of the records taken from other sources, I am alone responsible, and my acknowledgments are due to Mr. H. J. Burkill for the localisation of the three gall mites noted as from Yorkshire in his 1916 paper;* to Mr. W. P. Winter for local lists of his captures (*teste* Rev. J. E. Hull, and to Mr. C. Warburton for a copy of his British Oribatidæ paper.*

BIBLIOGRAPHY

OF PUBLICATIONS REFERRING TO YORKSHIRE SPECIES.

A. D. MICHAEL.

1883 and 1887.—British Oribatidæ, 2 vols., *Ray Society*.

C. D. SOAR.

1899.—British Freshwater Mites *Science Gossip*, New Series, Aug., p. 80 (one Yorkshire species).

WARBURTON and PEARCE.

1905.—On New and Rare British Mites of the Family Oribatidæ, *Proc. Zool. Soc. London* (published Ap. 5th, 1906), Vol. II. pp. 564-569 two plates, 9 figs (two Yorkshire mites new to Science described and figured).

T. SHEPPARD.

1911.—British Velvet Mites, *The Naturalist*, Nov., p. 372. Notification of presentation of Dr. George's types to Hull Museum, with dates of his papers in *The Naturalist*.

* See Bibliography.

- 1915.—New and Scarce British Arachnida, *The Naturalist*, Feb. p. 63. Further presentation of mites to Hull Museum by Dr. George.

NUTTALL WARBURTON, etc.

- 1907, *et seq.*, Ticks.—Monograph of the Ixodidae, *Cambridge Press*, (one Yorkshire species noted).

C. F. GEORGE.

- 1911.—Notes on the Cista of Some British Earthmites. *The Naturalist*, May, pp. 200-1.
 1913.—New Mites—*Trombidium mushami* Geo., *The Naturalist*, Nov. p. 383 with figures.
 1914.—*Trombidium bicolor* Herm., *The Naturalist*, Jan., p. 11, with figures.
 1915.—*Ottonia ignota* George, *The Naturalist*, Oct., p. 306, with figures.
 1916.—*Trombidium parvum* George, *The Naturalist*, June, pp. 189-190 with figures.

W. FALCONER.

In the Annual Reports of the Arachnida Committee of the Yorkshire Naturalists' Union, in the January issues of *The Naturalist* :—

- 1913 p. 83 ; 1914, pp. 42-3 ; 1916, p. 41 ; 1917, p. 43 ; 1919, p. 41 ; 1920, p. 43 ; 1922, p. 44 ; 1923, pp. 41-2.
 1914.—Yorkshire Arachnida in 1912-13, *The Naturalist*, March, pp. 87-9.
 1915.—Arachnida of the Sawley district, *The Naturalist*, Nov., p. 364.
 In the accounts of the Yorkshire Naturalists' Union meetings at the following places in *The Naturalist* :—
 1915.—Hambleton, Sep., p. 287 ; Hebden Bridge, Sep., p. 297.
 1916.—Bolton Woods, Aug., pp. 268-9.
 1919.—Ryhill, Aug., p. 273 ; Hawes, Sep., p. 306.
 1920.—Reeth, Aug., p. 255.
 1922.—Bingley, Aug., p. 232.
 1918.—Plant Galls from the Huddersfield District, *The Naturalist*, May, p. 168 (13 gall mites noted).
 1918.—Plant Galls from the Bridlington District, *The Naturalist*, December, p. 384 (3 gall mites noted).
 1919.—Plant Galls from the Scarborough District, *The Naturalist*, Dec., p. 393, (8 gall mites noted).
 1920.—Plant Galls from Wensleydale, *The Naturalist*, Jan. p. 30 (15 gall mites noted).
 1920.—Some Records of Lancashire Water Mites, *Lancs. and Cheshire Naturalist*, June, pp. 303-4, with notices of Yorkshire species.
 1920.—Plant Galls from Swaledale, *The Naturalist*, Nov., p. 361 (12 gall mites noted).
 1921.—Plant Gall Forays at Leeds, *The Naturalist*, Aug., pp. 269-272, Dec., pp. 405-8 (19 gall mites noted).
 1922.—Additions to the Plant Galls of Scarborough, *The Naturalist*, Jan., p. 24 (4 gall mites noted).
 1922.—Plant Galls from Selby and York, *The Naturalist*, Apr., p. 130 (13 gall mites noted).
 1922.—Naturalists' Field Day at Askham Bog, *The Naturalist*, Oct., p. 330 (4 gall mites noted).
 1922.—Plant Galls—Thorner to Collingham, *The Naturalist*, Dec. pp. 373-6 (6 gall mites noted).
 1923.—Annual Report of Plant Galls Committee for 1922, *The Naturalist*, Jan., pp. 44-6 (8 gall mites noted).
 1923.—Two British Mites New to Science and a New Subgenus of *Macrocheles* Latr., with 6 figures, *The Naturalist* April, pp. 151-3.

H. J. BURKILL.

1913.—Abnormality in Foxglove, *The Naturalist*, October, pp. 353-4.

1916.—Additions to the List of British Plant Galls, *Entomologist*, Jan., pp. 1-5 (3 Yorkshire gall mites noted).

1922.—Plant Galls observed near Scarborough in 1921, *The Naturalist*, June, pp. 193-6 (16 gall mites noted).

J. E. HULL.

1914.—British Oribatidæ, *The Naturalist*, Sept., pp. 282-3 (one Yorkshire species, *Carabodes scymnus* sp. nov., 1 figure).

1915.—Acari from Birds' Nests, *The Naturalist*, Dec., pp. 398-9. Nine species, one new. Two figures.

1916.—Terrestrial Acari of the Tyne Province—I., Oribatidæ, *Trans. N. H. S. of Northumberland, Durham and Newcastle-upon-Tyne, New Series, Vol. IV., Pt. II., July, 1 plate, 9 figures.*

1917.—Title as above: I., Additions, Oribatidæ; II., Thrombidiidæ, pp. 4-41; III., Gamasidæ, pp. 41-86, same *Trans.*, Vol. V., Pt. I., June, 3 plates, 82 figures.

1921.—Descriptions of New Mites, *Vasculum*, Feb., p. 19, (one species new to Yorkshire).

R. S. BAGNALL and J. W. H. HARRISON.

n.d.—New British Mite Galls, *Entomologist's Record*, Vol. XXIX., No. 5 (Reprint), pp. 1-6 (6 Yorkshire gall mites noted).

R. S. BAGNALL.

1917.—Galls of the Alpine Rose—*Eriophyes alpestris* Nal., *The Naturalist*, Nov., p. 364.

J. M. BROWN.

1920.—Additional Plant Galls from the Scarborough District, *The Naturalist*, Feb., p. 74 (3 gall mites noted).

F. A. MASON.

1922.—In 'Yorkshire Naturalists at Thornton Dale,' *The Naturalist*, Aug.-Sept., p. 295 (2 gall mites noted).

W. P. WINTER.

1922.—In 'Yorkshire Naturalists at Bishopdale,' *The Naturalist*, Dec., p. 388 (9 gall mites noted).

Dr. George, from time to time in *The Naturalist*, described and figured a considerable number of mites, mainly from Lincolnshire. Many of these have now been taken in Yorkshire, but the Rev. J. E. Hull, who has examined his types in the Hull Museum, has identified a large proportion of them with species previously published by foreign authors, so that his names in these instances have either become synonyms, or, if of prior publication, have since been segregated generically. References to these names and descriptions are given in the list, each in its proper place. His papers, which have as yet no connection with Yorkshire species, may, if needed, be looked up in the following issues of this magazine: (1) 'Lincolnshire Freshwater Mites,'—9 species, chiefly of the genus *Arrenurus*, 1903, March and June, 1904 April and May, 1905 January and December, 1906 February; (2) 'Lincolnshire Mites.'—1906 August, pp. 264-7, 3 species of *Epicrius*, 1907 *Rhyncolophus plumipes* Luc. (*Eatoniana*), October, p. 358.

(*To be continued.*)

YORKSHIRE HEMIPTERA IN 1922.

JAMES M. BROWN, B.Sc., F.L.S., F.E.S.

NOTWITHSTANDING the rather poor season, our knowledge of the distribution of the Yorkshire Hemiptera has been considerably extended during 1922. Now that the records are all to hand, it is possible to add 38 species (12 Heteroptera and 26 Homoptera) and one variety (of Homoptera) to the county list.

Several interesting records are due to Mr. G. B. Walsh, chiefly for Vice-county 62, including rare species new to Yorkshire. (For details see *The Naturalist*, 1922, pp. 199 and 250.)

Mr. T. B. Kitchen forwarded for determination a collection made in the Leeds district; while the writer has collected extensively around Bridlington (for particulars see *The Naturalist*, 1923, pp. 157-159); at Askham Bogs (*The Naturalist*, 1922, p. 328); and in the neighbourhood of Sheffield.

To make the county record as complete as possible, the list of 'Psyllidæ of the Cleveland' collected by Dr. Harrison (*The Naturalist*, 1915, pp. 400-401) has been included.

Thanks are due to Mr. E. A. Butler, who has examined a number of Heteroptera, and to Mr. J. Edwards who looked over several of the Homoptera.

References :—

†=New to the County. *=New to the Vice-county.
G.B.W.=G. B. Walsh. T.B.K.=T. B. Kitchen.
J.W.H.H.=J. W. H. Harrison.

Records not initialled are my own.

HETEROPTERA.

- †*Rhacognathus (Asopus) punctatus* L. Skipwith, G.B.W.
- †*Coreus denticulatus* Scop. Ecclesall Woods, Sheffield. One specimen on flowers of *Heracleum* (7/21). This species has not previously been taken north of Lincolnshire.
- Nysius thymi* Wolff. Mouth of the Tees, G.B.W.
- †*Rhyparochromus chiragra* F. Flixton Sand Pit, G.B.W.
- Stygnocoris pedestris* Fall. Middleton-in-Teesdale, G.B.W., *65. Bridlington, *61.
- Trapezonotus arenarius* L. Ringinglow, near Sheffield, *63.
- Drymus brunneus* Sahlb. Eston Nab, G.B.W., *62.
- Scolopostethus thomsoni* Reut. Thorner and Wothersome, T.B.K., *64. Askham Bogs, *64.
- †*Acalypta (Orthostira) parvula* Fall. Lartington, G.B.W.
- Derephysia foliacea* Fall. Wentworth, *63. A single specimen was swept from grass.
- Monanthia cardui* L. Bridlington, *61.
- Gerris thoracicus* Schum. Swillington, T.B.K., *64.

- Salda littoralis* L. Askham Bogs, in considerable numbers.
S. orthochila Fieb. Ringinglow, amongst heather.
S. C-album Fieb. Wothersome, T.B.K., *64. Bridlington, *61.
Lycocoris campestris F. Ecclesall Woods.
Tetraphleps vittata Fieb. Bridlington, *61.
Microphysa pselaphiformis Curt. Kirkby-in-Cleveland, G.B.W., *62.
 This species has not been recorded in the county since Curtis' time, 1833.
Miris calcaratus Fall. Askham Bogs, Wike, T.B.K. Ecclesall Woods.
Teratocoris saundersi D. & S. Sleights (Whitby), M. L. Thompson, *62; Wentworth, *63. This last was incorrectly recorded as *T. antennatus* (*The Naturalist*, 1921, p. 308), which species must therefore be deleted from the County list (*The Naturalist*, 1921, p. 417).
Leptopterna ferrugata Fall. Wharnccliffe, *63. Bridlington.
L. dolabrata L. Aberford, T.B.K., *64. Bridlington.
Pantilius tunicatus F. Ryecroft Glen, near Sheffield. This species occurs on Hazel and Alder, in late summer and early autumn.
Phytocoris ulmi L. Bridlington district, Wharnccliffe.
P. tiliæ F. Burton Agnes.
P. longipennis Flor. Not uncommon in the Bridlington district, *61.
Calocoris sex-guttatus F. Wothersome and Aberford, T.B.K., Wentworth, Oughty Bridge, Bridlington. This species occurs frequently and in numbers on flowers of *Heracleum* and similar plants.
C. fulvo-maculatus DeG. Aberford, T.B.K., *64.
C. alpestris Mey. Roundhay and Aberford, T.B.K. Raincliffe Woods, G.B.W. Plentiful on low plants in Ecclesall Woods (Sheffield).
C. bipunctatus F. Wentworth, Bridlington district.
 †*C. lineolatus* Goeze. Easton (Bridlington). Plentiful on *Ononis*, and probably occurring in other localities where this plant is to be found.
 †*C. infusus* H.S. Ecclesall Woods. One specimen resting on the trunk of an Oak. Notts is the most northerly locality given by Mr. Butler for this species.
C. striatus L. Askham Bogs, *64. It also occurs sparingly on tree trunks in Ecclesall Woods.
Plesiocoris rugicollis Fall. Askham Bogs, Wentworth. A very usual species on Sallows.
Lygus pabulinus L. Wothersome, T.B.K. Bridlington district. Wharnccliffe, Wentworth.
L. contaminatus Fall. Bridlington, Ecclesall Woods.
L. viridis Fall. Bridlington, Wharnccliffe, *63.
L. lucorum Mey. Bridlington.
L. pratensis L. Thorner, Adel. Wothersome, T.B.K. Bridlington district. Wentworth. This is one of the commonest species of the genus.
L. rubricatus Fall. Boynton, near Bridlington, *61. It occurs on Conifers and should be found in other localities.
L. cervinus H.S. Bridlington, *61. Wentworth, *63. Frequent on Limes.
L. pastinacæ Fall. Bessingby, near Bridlington, *61.
L. kalmii L. Bridlington, *61. Ecclesall Woods, *63.
Liocoris tripustulatus F. Thorner and Wothersome, T.B.K., *64. Bridlington district.
Rhopalotomus ater L. Bridlington, Wentworth.
Dicyphus epilobii Reut. Bridlington district, *61. Wentworth, Wharnccliffe, Ecclesall Woods.
Dicyphus errans Wolff. Oughty Bridge, Ecclesall Woods, *63. Askham Bog, *64.
D. stacnydis Reut. Bridlington, *61. Askham Bogs.

- Dicyphus pallidicornis* Fieb. Wharncliffe, *63.
Cyrtorrhinus caricis Fall. Wentworth.
†*C. flaveolus* Reut. Hull, G.B.W. This appears to be a rare species in this country. Mr. Butler ('Biology of the British Hemiptera-Heteroptera') gives records only for Norfolk, Suffolk, Kent and Dorset.
Orthotylus viridinervis Kb. Burton Agnes, *61.
O. ericetorum Fall. Ringinglow, *63.
Malacocoris chlorizans Fall. Boynton, near Bridlington, *61. Wentworth, *63.
†*Megalocoleus molliculus* Fall. Bridlington.
†*Macrotylus solitarius* Mey. Bridlington. On *Stachys*. Not previously recorded north of Notts. I have also taken it in Derbyshire, so can add two counties to the list of eight given by Mr. Butler.
M. paykulli Mey. Bridlington, *61.
Harpocera thoracica Fall. Thorner, T.B.K., *64. Forge Valley, G.B.W., *62.
Byrsoptera rufifrons Fall. Aberford, T.B.K., *64. Bridlington, *61.
Phylus palliceps Fieb. Askham Bogs, *64.
†*P. coryli* var. *avellanae* Mey. Bridlington.
Psallus ambiguus Fall. Aberford, T.B.K. Ecclesall Woods (Sheffield).
P. betuleti Fall. Askham Bogs.
P. variabilis Fall. Aberford, T.B.K. Askham Bogs.
†*P. alnicola* D. & S. Bridlington district. Ecclesall Woods. Wentworth.
P. fallenii Reut. Bridlington, Askham Bogs, Wentworth, Wharncliffe.
P. varians H.S. Askham Bogs.
†*P. diminutus* Kb. Askham Bogs.
P. roseus F. Burton Agnes, *61. Wharncliffe, *63.
Atractotomus magnicornis Fall. Bridlington district, *61.
Plagiognathus chrysanthemi Wolff. Bridlington, *61.
Asciodema obsoletum D. & S. Bridlington, *61.
Corixa venusta D. & S. Carter Knowle (Sheffield).
C. praeusta Fieb. Carter Knowle, Ringinglow.

HOMOPTERA.

- Triecphora vulnerata* Illig. Ryecroft Glen, near Sheffield. One specimen only. It appears to be commoner on the Derbyshire side of the boundary.
Philaenus campestris Fall. Bridlington, *61.
Megophthalmus scanicus Fall. Bridlington, *61. Wentworth, *63.
†*Macropsis scutellata* Boh. Ecclesall Woods.
†*Idiocerus vitreus* Fab. Burton Agnes. On Lombardy Poplar.
I. fulgidus Fab. Burton Agnes, *61.
I. populi L. Burton Agnes, *61.
I. confusus Flor. Ecclesall Woods, Wharncliffe, Bridlington district, *61.
Agallia puncticeps Germ. Raincliffe Woods, G.B.W. Ecclesall Woods, Ringinglow, Bridlington district, *61.
†*Agallia venosa* Fall. Oughty Bridge, Bessingby.
A. brachyptera Boh. Bridlington. This find confirms an old record from Scarborough.
Acocephalus bifasciatus L. Ringinglow, *63.
A. albifrons L. Wentworth, Bridlington, *61.
†*A. limicola* Edw. Hull, G.B.W.
A. flavostrigatus Don. Bridlington district, *61.
Athysanus brevipennis Kbm. Bradfield, near Sheffield.
A. sordidus Zett. Wentworth, Bridlington district, *61.

- †*Athysanus sahlbergi* Reut. Barnard Castle, G.B.W.
 †*A. plebejus* Fall. Bridlington district.
A. lineolatus Brulle. Bridlington district, *61.
A. obsoletus Kbm. Wharncliffe, Bridlington, *61.
 †*Deltocephalus flori* Fieb. Wentworth, Wharncliffe, Ecclesall Woods.
 This is probably one of the commonest of the genus, but seems to have been overlooked.
D. distinguendus Flor. Wentworth, Wharncliffe.
 †*D. socialis* Flor. Bridlington.
 †*D. thenii* Edw. Bridlington district. Askham Bogs. This is another common and apparently overlooked species.
D. pascuellus Fall. Wentworth, Bridlington district, *61.
D. pulicaris Fall. Oughty Bridge, Askham Bogs, Bridlington, *61.
Thamnotettix subfuscus Fall. Raincliffe Woods, G.B.W., *62.
T. splendidulus Fab. Boynton, *61.
Limotettix 4-*notata* Fab. Easton (Bridlington), *61.
 †*L. persimilis* Edw. Bridlington district, Askham Bogs, Wentworth.
 This species occurs very plentifully among grass.
 †*L. nigricornis* J. Sahl. Wentworth. Swept in numbers from the damp grass near the lake.
L. sulphurella Zett. Scalby High Moor, G.B.W., *62.
 †*L. sulphurella* Zett. var. *lutea* Edw. Carnaby.
 †*L. (Stictocoris) flaveola* Boh. Wentworth. Swept from grass near the lake.
Cicadula 7-*notata* Fall. Bridlington district, *61.
 †*C. warioni* Leth. Askham Bogs.
C. 6-notata Fall. Askham Bogs, *64. Bridlington district, *61.
C. fieberi Edw. Askham Bogs.
Alebra albostriella Fall. Ecclesall Woods, Bridlington district.
Dikraneura flavipennis Zett. Askham Bogs, *64.
 †*D. similis* Edw. Askham Bogs.
D. mollicula Boh. Wharncliffe.
D. variata Hdy. Ringinglow. Very common among grass.
 †*Chlorita flavescens* Fab. Ecclesall Woods (January). Roche Abbey (April). This species may be beaten from Pines and Yews during the Winter and early Spring months.
 †*C. viridula* Fall. Silpho Moor, G.B.W.
 †*Eupteryx vittatus* L. Bessingby.
E. atropunctatus Goeze. Ravenscar, G.B.W., *62. Bridlington district, *61. Askham Bogs, *64. Sheffield district.
E. signatipennis Boh. Bridlington district, *61.
E. pulchellus Fall. Bridlington district, *61.
E. concinna Germ. Burton Agnes, *61. Oughty Bridge, Ecclesall Woods.
Typhlocyba tenerrima H.S. Bridlington district, *61. Wentworth, Wharncliffe and Sheffield district generally. It seems to occur wherever Brambles are to be found.
 †*T. douglasi* Edw. Bridlington district. Ecclesall Woods.
T. crataegi Dougl. Oughty Bridge, Bridlington district, *61.
T. lethierryi Edw. Ecclesall Woods.
 †*T. rosae* L. Askham Bogs. Sheffield district generally. This is a very common and plentiful species found on the rose.
T. quercus Fab. Bridlington district, *61. This species sometimes occurs in swarms.
T. geometrica Schr. Bridlington, *61. Oughty Bridge. An occasional species on trees such as Alder, but never in large numbers.
Zygina alneti Dahl. Ecclesall Woods.
 †*Z. coryli* Toll. Bridlington, Wharncliffe.
 †*Z. neglecta* Edw. Wentworth, Ecclesall Woods. This small species is to be found hiding in Ivy and Hawthorn; it has probably often been confused with *Z. flammigera* Geof.

- Cixius brachycranus* Scott. Seamer Moor, G.B.W., *62.
Conomelus limbatus Fab. Seamer Moor, G.B.W., *62. Ecclesall Woods. Bessingby, *61.
†*Delphax pellucida* Fab. Bridlington. Ecclesall Woods.
†*D. difficilis* Edw. Ecclesall Woods. This species and the next are probably widely distributed. They may be swept from grass.
D. discolor Boh. Hayburn Wyke, Kirkby in Cleveland, G.B.W., *62.
†*D. fairmairei* Perris. Bridlington.
Dicranotropis hamata Boh. Wharnccliffe. Ecclesall Woods. Bessingby, *61.
Rhinocola ericae Curt. Great Ayton Moor, J.W.H.H.
†*Aphalara picta* Zett. Bridlington.
A. calthae L. Marton, etc., J.W.H.H.
Psylla pyricola Först. Lonsdale, J.W.H.H.
P. costalis Flor. Cleveland, J.W.H.H. Wharnccliffe. Wentworth.
P. peregrina Först. Staintondale, G.B.W. Cleveland, J.W.H.H.
P. mali Schm. Cleveland, J.W.H.H.
P. forsteri Flor. Cleveland, J.W.H.H. Wharnccliffe.
P. hartigii Flor. Great Ayton, J.W.H.H.
P. melanoneura Först. Cleveland, J.W.H.H. Bridlington, *61.
P. nigrita Zett. Cleveland, J.W.H.H. Ecclesall Woods, *63.
Bridlington, *61.
Psylla salicicola Först. Nunthorpe, Hemlington, J.W.H.H.
P. ambigua Först. Nunthorpe, Marton, J.W.H.H. Bridlington, *61.
P. spartii Guer. Lonsdale, J.W.H.H.
†*P. sorbi* L. Hayburn Wyke, G.B.W.
Arytaena genistae Latr. Lonsdale, J.W.H.H.
Trioza albiventris Först. Nunthorpe, J.W.H.H.
T. urticae L. Cleveland, J.W.H.H. Bridlington, *61. Sheffield district, *63.

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The Races of England and Wales, by **H. J. Fleure**. London: Benn Bros., Ltd., 118 pp., 5/- net. Professor Fleure has written a readable little treatise which, in view of the revival of interest taken in these matters in recent years, should prove to be popular. He gives illustrations of a number of ancient and modern types of heads, and a useful bibliographical index.

Our Butterflies and Moths, by **E. F. Daglish**. London: Thornton Butterworth, Ltd. 6/- net. The 126 pages on stout paper bulk well. There is a chapter on How to use the Book; Keys to British Butterflies and Moths, with descriptions under the heads of Caterpillar, Chrysalis, Remarks, etc. There are numerous diagrams in the text, and plain and coloured plates, some of the latter being very good.

The Racial History of Man, by **Roland B. Dixon**. London: C. Scribner's Sons. xvi.+583 pp., 25/- net. This substantial volume is the result of an experiment by the author. Some years ago he endeavoured to bring order out of chaos relating to the Anthropology of the Oceanic Area. The results were so successful that he has now tackled the question for the whole of the world. He professes to deal with the subject entirely *de novo*, with the actual data obtained from the raw facts of physical measurements, and has intentionally paid little or no heed to the conclusions of previous students. Obviously the author has thoroughly investigated the literature on the subject, and illustrates his remarks by numerous diagrams, reproductions of photographs of typical race types; and he gives a Bibliography occupying over forty pages, though this does not appear to include a reference to Ratzell's well-known volumes. There are 44 plates, and the book is divided into six sections dealing with Europe, Africa, Asia, Oceania, North America, South America.

REVIEWS AND BOOK NOTICES.

Common Plants, by **Macgregor Skene, D.Sc.** London: Melrose, pp. 271, 6/- net. Dr. Skene has made a very interesting contribution to the 'Common Things' Series, edited by Prof. J. Arthur Thompson, and we can recommend the work with confidence to all who desire a sound general knowledge of plant life without pursuing a formal course of botany. The work is an able exposition of plant life in a very readable form, the story being woven around common and mostly familiar species. The main problems of nutrition are introduced in the history of the wheat plant, colour and its significance is based on the maple leaf; saprophytes and parasites illustrate abnormal and specialised nutrition. Other chapters deal with regulation of plant movements, plant life in water, fungi injurious and useful, origin and ascent of a land flora, evolution of a moor, land flora, the climax, fossils and a doomed race. Thus are the various aspects of plant life dealt with, and throughout the interest of the reader is maintained.

The Badger, Afield and Underground, by **H. Mortimer Batten, F.Z.S.** 153 pp. and index, published by H. F. & G. Witherby, price 8/6 net. To the making of books dealing with the British fauna there appears to be no end, and it seems almost impossible for anything new to be said in connexion therewith. The Badger, however, has received little attention, possibly because, on account of his nocturnal habits, he is so little known and so generally misunderstood. Mr. Batten, however, has a good story to tell, and has approached his subject in a sympathetic manner, and while not blind to the Badger's faults, shows that the good and inoffensive points of the most persecuted animal in these islands far out-balance any bad ones. In the ten chapters Mr. Batten covers the history of the Badger in a comprehensive manner; he corrects many fallacies and throws new light upon disputed questions, and has many pleasant things to say about the disposition of an interesting but misunderstood beast, who, in captivity, becomes friendly, affectionate and lovable. The almost universal belief that the Badger is the last remaining member of the bear family in Britain is corrected, for although very bear-like in most of his habits, he is really a member of the family of *Mustelidae*. The book should appeal especially to Yorkshire naturalists, as in the narrative are many references to Yorkshire, particularly in connection with Wharfedale and the North Riding, localities in which the author resided for some time. A particularly amusing incident is related in the chapter dealing with sport; it occurred in the Kirkby Moorside district, where all the local ne'er-do-wells gathered for a Badger dig—these men who, as a rule, would not do a real day's work for untold gold. Nevertheless, so keen were their sporting instincts, that they spent a perspiring and laborious day in digging, following a terrier who was 'tailing' a Badger, only to find after hours of strenuous work, that he had led them on the track of a baby rabbit. A particularly discreditable incident is also recorded from the same neighbourhood, where a keeper came across a sow Badger and four cubs rooting about, made a vicious onslaught upon them and kicked the cubs to death. Mr. Batten truly points out that the local treatment of Badgers depends a good deal upon the example set by the fox hunt. One pack in Yorkshire does not shine in this respect, as it has more than once killed over 100 Badgers in a season with hounds, unsporting conduct which cannot be too strongly condemned. The sport as advocated by the author gives a good deal of interest and amusement, besides physical exercise, and leaves the Badgers no worse at the end. The book, which is illustrated by some of Miss Frances Pitt's excellent photographs, (not, however, very well reproduced), should do much to bring about a better and more sympathetic understanding of one of the most ancient inhabitants of these islands, and help to put an end to the many cruelties practised upon an interesting and inoffensive animal.—R.F.

Pets for Boys and Girls, by **A. J. Macself**. London: Thornton Butterworth, Ltd. 302 pp., 5/- net. When and How to Buy a Canary; Training and Education of Dogs; Bantam Fowls; Points of a Good Mouse; Indoor and Outdoor Aquarium; Tortoises, and similar subjects, are dealt with in the ten chapters comprising this volume. It is evidently written for the young people, though older ones would get much useful information from it.

We should like to thank the house of Nelson for the facilities they give to those desirous of reading healthy literature in these days of expensive books. For two shillings it is now possible to buy well bound and well printed classics in science, art and literature. Recently the firm has issued W. H. Hudson's **The Book of a Naturalist**, and Fabre's **Book of Insects**—both works well known to our readers, who will no doubt be glad to learn that they can be purchased so easily.

Epping Forest, by **E. N. Buxton**. London: E. Stanford, Ltd. xii. + 182 pp., 2/6. That this little volume has reached its ninth edition is sufficient evidence of its popularity. Its shape is suitable for the pocket, there are numerous excellent maps and descriptions, and we think many other districts might be treated similarly. In addition to the history, geography, and various routes, an account is given of the Zoology, Botany, Geology, Prehistoric Remains, etc., of this interesting area.

Pan's People: the Lure of Little Beasts, by **The Hon. Gilbert Coleridge**. London: T. Fisher Unwin, 9/- net. This contains a series of essays, some of which have previously appeared in the *Fotrnighly*, *Contemporary* and *Albany Reviews*, the *Cornhill Magazine* and the *Pilot*, which will give our readers an idea of their nature. The volume deals with Friend Robin; Hippo the Sage; Wild Life in Kensington Gardens; The Heron; The Cormorant; Telepathy; Animal Attractions and Repulsions; and similar subjects. The essays are pleasantly written.

A Naturalist's Holiday by the Sea, by **A. De C. Sowerby**. London: G. Routledge & Sons, xi. + 262 pp., 7/6 net. To the growing number of well illustrated volumes dealing with various aspects of marine life, Messrs. Routledge have added a volume which from its cheapness and wealth of illustration, bids fair to become popular. The sea-weeds, crustaceans, fishes, worms, birds and shells receive much attention, in addition to which The Eel's Wonderful Journey; Submerged Forests; Stranded Whales, and the Collecting of Land Shells, find a place. The chapters dealing with Cornish Rocks and Minerals, and Birds of the Cornish Peninsula give a hint as to the area dealt with.

British Association for the Advancement of Science. List of papers bearing upon the Zoology, Botany and Prehistoric Archæology of the British Isles, 1921, by **T. Sheppard, M.Sc.** 64 pp. Among the publications of the British Association for the Advancement of Science none is more earnestly waited for by Zoologists, Botanists and Archæologists than the 'List of Papers' bearing on these subjects published in the British Isles. The number now issued bears the stamp of much patient labour, and is as complete as its predecessor. The scientific world owes a deep debt of gratitude to Mr. Sheppard for this invaluable book of reference. The alphabetical classification of authors has much to recommend it, but for practical purposes would it not be better to arrange the papers according to subjects, using, *e.g.*, the Dewey system (cf., *Bibliographia Zoologica*).—J.J.S.

This question has been considered by the compiler, but as this and similar lists for which he is responsible occupy on an average two hours each day all the year through, and the work is honorary, he already spends as much time as he can afford; in addition to which so very many of the papers appearing in the proceedings of the provincial societies occupy so large a field that considerable repetition would occur, which costs time and money.—ED.

NEWS FROM THE MAGAZINES.

The editor of *Discovery* considers that his paper fulfils a very definite purpose.

The Rev. C. R. N. Burrows contributes 'Notes on the Psychides' to *The Entomologist's Record* for March.

C. B. Moffatt discusses the question as to whether the Squirrel is a native of Ireland, in *The Irish Naturalist* for April.

R. I. Pocock contributes an illustrated article on 'Composite Animals, Some Remarkable Experiments,' to *Conquest* for March.

Science tells us that 'year after year great hoards of gipsy moths of New England have been coming closer to the eastern border of New York.'

Some skeletons recently found near Paris are considered to be Neolithic, as 'a number of flint spear-heads and one *flint sword*' have been found, according to the daily press.

Allen Mawer writes on 'Some Types of English Place-names' in *Discovery* for April. The same journal contains 'Cement Manufacture along the Humber,' by R. C. S. Walters.

We have been favoured by a copy of 'Lès Foraminifères des Sables Rouges du Golfe d'ajaccio (Cote Nord),' par E. Heron-Allen et Arthur Earland, which contains excellent plates.

The Haworth Ramblers continue to issue their interesting programmes, that for Easter referring to Rathmell and Whelpstone Crag, the leaders being Miss Hanson and Mr. J. Bradley.

Dr. Woodhead favours us with a report of his presidential address to the Yorkshire Naturalists' Union at Scarborough. It has been printed on stouter paper, and the arrangement of the illustrations is much improved.

We have received the first part of Volume IV. of *The Murrelet*, the official bulletin of the Pacific North West Bird and Mammal Society, which consists of 14 quarto pages of clear typewritten matter, tastefully bound together.

The Journal of Roman Studies for March contains, among other matter, 'The Building of the Antonine Wall: a Fresh Study of the Inscriptions,' by G. Macdonald; and 'Hadrian's Wall: a History of the Problem,' by R. G. Collingwood.

In March was issued part XVI. of Witherby's *Practical Handbook of British Birds* (pp. 625-720), dealing with the Redshank, Phalarope, Godwit, Curlew, Snipe, Tern, etc. There are illustrations, on plates, of nestlings, some coloured.

Among the contents of *Science Progress* for April we notice 'The Cult of the Trilobites,' by Prof. G. A. J. Cole; 'Time-relations in Amphibian metamorphosis, with some general considerations,' by Julian Huxley; and 'The Evolution of the Caterpillar,' by H. Mace.

Among the changes in the names of Ammonites occurring in Part XXXVIII. of Buckman's *Type Ammonites*, we notice our old friend *A. perarmatus* is *Aspidoceras silphouense*; *A. subcontractus* becomes *Sphaeromorphites sphaeroidalis*, and another time is *Tulophorites praeclarus*; *Macrocephalites macrocephalus* is now *Tmetokephalites bathytmetus*; and *M. typicus* is *Dolikephalites dolius*.

Among the contents of *The Antiquaries Journal* for April, we notice 'Early Anglo-Saxon Weights,' by R. A. Smith; 'The Age of Stonehenge,' by E. H. Stone; 'An Early Palæolith from the Glacial Till at Sidestrand, Norfolk,' by J. R. Moir; 'Two Irish Bronze-Age Finds containing Rings,' by E. C. R. Armstrong; 'Two Flint Celts from Dorset,' by the Rev. H. G. O. Kendall.

'*Punch* tells us that "In the body of a cow recently killed at Keighley, Yorkshire, were ten pieces of glass, stones and earthenware, a bone, a blade of a kitchen knife, six brass cartridge cases and eight pieces of tin."'
—*Daily Paper*. The farmer states that he was often struck by the more than usually thoughtful expression of the animal when chewing her cud? But *Punch* forgot to head the paragraph 'A Yorkshire Bite.'

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EDITED BY

T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;

AND

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WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

G. T. PORRITT, F.L.S., F.E.S.

JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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☆ JUN 12 1923 ☆

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Members meet at Selby Station at 10-14 a.m. on the arrival of the Leeds train.

The route taken will be along the river bank from Selby Bridge to Barlby, and along the Bubwith Road for about two miles, where a road to the left leads on to the Common.

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NOTES AND COMMENTS.

THE ROMANS IN CLEVELAND.*

Under the above heading our contributor, Mr. Frank Elgee, gives an illustrated account of the various evidences of Roman occupation found in the district with which he is so familiar. The object of this pamphlet is probably best explained in Mr. Elgee's own words:—'This work brings together for the first time all that is known of Roman Cleveland, and it includes many new and hitherto unrecorded evidences of the Roman occupation. The subject is treated on modern lines, from a geographical as well as an archæological point of view. As the last history of Cleveland was written fifty years ago, it will be evident that there is room for an up-to-date account of Roman Cleveland. The book has been written not only for the public, but also for the use of teachers and scholars throughout the district. They will find it of great help in teaching or studying local history. Such local history should form the basis for all elementary instruction in wider historical and human studies, and it is my intention to follow up this work with other handbooks on the district.'

THE NATURAL HISTORY OF WICKEN FEN.†

The very mention of Wicken Fen brings many memories to old-time naturalists, and in view of the changes constantly taking place there it seems desirable that a permanent record should be made of its natural history capabilities. Under the editorship of J. Stanley Gardiner and A. G. Tansley it is proposed 'To issue a series of parts at intervals, the whole to form one volume,' the present being the first. It contains 'The Fens of the Great Level, their Drainage, and its effect on the Flora and Fauna'; and 'Full List of Plants growing in the Old Fen Land at Wicken,' both by A. H. Evans; 'Terrier of Wicken and Burwell Fen Estates'; and 'The Lepidoptera of Cambridgeshire,' by W. Farren.

MUSEUMS ASSOCIATION CONFERENCE AT HULL.

Arrangements are well in hand for the Annual Conference of the Museums Association which is to take place at Hull during the week commencing July 9th. It is ten years since the Association visited Hull previously, when the Museums Curator, Mr. T. Sheppard, M.Sc., was the Local Secretary. This year he is honoured by being the President of the Association. The Lord Mayor has kindly promised to give a reception to the delegates, who will also be entertained to luncheon on the Tuesday and Wednesday. There will be a conversazione,

* 24 pp., 2/8 post free, from the Author and Publisher, Comondale, York.

† 64 pp., 3/6 net. Bowes & Bowes, Cambridge.

various morning sessions for the reading and discussion of papers bearing upon Museum work, visits to the different Museums, and excursions to places in the neighbourhood during the afternoons.

VISIT TO DENMARK.

Mr. James Downs, J.P., has kindly agreed to act as Local Secretary for this meeting. Following the Conference, and by the kind invitation of the Ministry of Foreign Affairs in Denmark, the National Museum, Copenhagen, and other institutions in that city, such members of the Association as are able to do so are to visit Copenhagen, and special facilities are being arranged by the Shipping Companies. The Royal Danish Legation in London, and Mr. Pattinson, the Danish Consul in Hull, and others, are making every effort to ensure the success of the gathering. The party will be accompanied by the Lord Mayor, and will be officially received at the Town Hall (Raathus) at Copenhagen at a gathering which has been arranged to meet the members; and various organisations in Denmark have already arranged to entertain the visitors to lunch, etc. There is thus a prospect of a very successful gathering.

FRUIT OF MARE'S-TAIL.

At a recent meeting of the Linnean Society of London, Dr. Rendle, F.R.S., with the aid of a lantern slide, demonstrated the structure of the fruit of the Mare's-tail (*Hippuris vulgaris* Linn.). The figures and description of the fruit of this well-known British plant in the text-books and floras are unsatisfactory, and overlooked points of detail in structure associated with the germination of the seed. The fruit is a drupe, the upper portion of which around the persistent base of the style, with the seedcoat, is developed in the form of a stopper which is easily withdrawn on soaking the ripe fruit. The embryo ultimately fills the seed, and has the large radicle and hypocotyl so often found in water plants. The speaker had been unable to get fruits of herbarium specimens several years old to germinate, and suggested that Fellows interested in British botany might look out for seedlings during the next season. The radicle was placed directly beneath the stopper which provided a place of exit on germination.

ANOTHER 'HOAX.'

With the various headings 'Big Skull Hoax—Patagonian Discovery only a Curious Stone—Blow to Scientists,' we learn that 'Reuter's Buenos Aires correspondent telegraphs this delightful story, reminiscent of the Pickwick Club and "Bill Stumps, his Mark."': "The Committee of scientists examining the supposed skull of the tertiary period which was found

in Patagonia, and over which there was much excitement several months ago, now declare that it is only a curiously-shaped stone and that it has no scientific value."

"A MILLION YEARS OLD."

"The Patagonian discovery last February thrilled the scientific world [!]. The 'skull' was estimated to be a million years old, twice the age of the famous Java skull and about 900,000 years older than the Piltdown (Sussex) skull. The Patagonian skull was found in the possession of a white settler by Dr. J. G. Wolf, formerly of the Canadian Geological Survey. 'Save for the lower jaw, which is missing,' said one enthusiastic account, 'the skull is perfect, with eye-sockets and teeth-sockets in place. The cranium is long and oval and the forehead very low and sloping.'"

BRITISH CETACEA.

From the map appearing in Sir Sidney F. Harmer's *Eighth Report on Cetacea Stranded on the British Coasts*, during 1921 and 1922, it would seem that only a single example (other than porpoises) is recorded for the whole of the counties covered by *The Naturalist*, this one record being a common porqual at Scarborough. The greater part of the records for the two years appear to be around the south-west coast of England and the north-east of Scotland. The Report, which contains many valuable records, is published at the British Museum (Natural History) for half-a-crown.

BRITISH GEOLOGY.

In *The Geological Magazine* for May Baron F. Nopcsa writes on 'Acanthopholis'; Prof. H. L. Hawkins on 'Cretaceous Echinoidea from Jamaica'; Prof. N. N. Yakovlev on 'The Relationship of Rugosa to the Hexacoralla'; Dr. E. O. Teale and W. Campbell Smith on 'Nepheline-bearing Lavas and Intrusive Rocks from South of the Zambesi River'; W. B. Wright on 'The Wagener Frequency Curve'; L. Dudley Stamp on 'The Oil Shales of Southern Burma'; and there are reviews of the 'Geology of Uganda and Southern Rhodesia.' Would that we could have William Smith on British Strata!

THE SOUTH SHIELDS MUSEUM.

Signs of activity on the part of the authorities at the South Shields Museum, a little while ago, were evident when the Museums Association was asked to recommend an expert to advise the committee with regard to the contents of the Museum in that town. Subsequently, however, it was decided 'on advice,' that an expert was not necessary, and that a local taxidermist should be called in to arrange the natural history specimens.

HARKER'S PETROLOGY.

We should like to congratulate Dr. Harker, at one time on the editorial staff of this journal, on the issue of the sixth edition of his now well-known 'Petrology for Students: an introduction to the Study of Rocks under the Microscope.' In his preface to this edition we learn that 'it has been written to serve as a guide to the study of rocks in thin slices, and is, of course, assumed to be supplemented throughout by demonstrations on actual specimens. Since it is designated primarily for the use of English-speaking students, examples are chosen, so far as is possible, from British, Colonial and American Rocks; and, indeed, the researches of British petrologists have now made it possible to illustrate almost all the leading rock-types from our own country. References to published descriptions are given in foot-notes. A few new figures have been added for the present edition, and some old ones have been withdrawn. Those given have been chosen mainly to illustrate typical rock-structures. Photographs and coloured plates of rock-slices may be sought in larger works.'

£20,000 GIFT TO LIVERPOOL UNIVERSITY.

A gift of £20,000 has been made to the University of Liverpool by Sir William Abbott Herdman, for the provision of a building for the Department of Geology, in memory of the late Lady Herdman, whose name the building is to bear. Sir William Herdman, C.B.E., D.Sc., was Professor of Natural History at the University from 1881 to 1919, and Professor of Oceanography from 1919 to 1921. Sir William has held several important positions in connection with the British Association, and he was President in 1920. He was knighted in 1922. He has, along with others, established a marine biological station at Port Erin, Isle of Man, and a sea-fish hatchery at Piel, near Barrow. He is hon. director to the Lancashire Sea Fisheries Committee. In 1901 he went on behalf of the Government to investigate the pearl oyster fisheries in Ceylon.

—: o :—

Sambucus Ebulus Linn., in West Yorkshire.—In company with Messrs. G. Milnthorpe and L. A. Nutbrown the writer recently saw *Sambucus Ebulus* growing in some quantity in the Barnsley area. As this station is not mentioned in *The Flora of West Yorkshire* it may be as well that its occurrence here should be recorded. It was seen to the left of the road about half-way between Birdwell Station and Pilley Church.—ARTHUR A. DALLMAN, 17 Mount Road, Higher Tranmere, Cheshire, April 16th, 1923.

PREHISTORIC BRIDLINGTON.*

T. SHEPPARD, M.Sc., F.G.S.

THE neighbourhood of Bridlington, with the sheltered Bay, the bold promontory of Flamborough to the north, the Wolds to the west, and the low-lying land of Holderness to the south, is exceptionally prolific in remains of prehistoric man, both of the Neolithic or New Stone Age, and of the later Bronze Age. A few traces of the men of the Early Iron Age have also occurred, the most notable instance being a Chariot Burial which I had the pleasure of excavating at Hunmanby a few years ago (see *Yorks. Arch. Journ.*, Part 76, 1907).

The relics of prehistoric man may be roughly divided into (1) Earthworks, (2) Barrows or Burial Mounds, (3) Lake Dwellings, and (4) Miscellaneous objects, principally implements, found on the surface of the ground. With regard to the former, the most remarkable is the so-called Danes' Dyke, which, however, is of pre-Roman date. It stretches right across the triangular headland of Flamboro', from north to south, like an enormous railway embankment. Its northern extremity is at a point known as Cat Nab, and it follows an almost continuous and straight line to the ravine near Sewerby. For most of the way it forms a prominent feature, accentuated by the growth of trees. Its object was evidently to protect the triangular area of land, over five square miles, to the east of the earthwork, the precipitous cliffs on the other sides of the triangle forming ample protection from the sea. In recent years we have heard much of trench warfare, and in no period of the world's history have so many trenches been cut as during the recent war. Yet at Flamboro' probably about 3,000 years ago, and long before shovels and pick-axes and steam-navvies were known, a trench was dug and an earthwork was thrown up by an unknown race, these being of far greater magnitude than anything of the kind made during this so-called civilized twentieth century. And our Flamboro' Dyke will doubtless still remain as a monument to the skill and industry of a unnamed and uncivilized people, long after all traces of the thousands of miles of trenches made during the great war have disappeared.

With regard to the earthwork itself; at Cat Nab, on the north, it reaches almost, but not quite, to the cliff edge. On the west side of the dyke is a ditch from which much of the material for the earthwork was obtained. For the most part the dyke is on fairly level ground, but on the southern section advantage has been taken of the natural ravine, consequently

* Address delivered at the Yorkshire Naturalists' Union meeting at Bridlington, 21st April.

the earthwork itself is not so conspicuous. The artificial ditch averages about 60 feet in width by 20 feet in depth. As the mound is an additional 15 or 20 feet high, its steep western slope of about 40 feet in all would be a difficult barrier to surmount; and would certainly be originally further protected at the top by a strong stockade.

The space between the north end of the earthwork and the cliff edge, as well as one or two breaks in the ridge, are evidently intentional and part of the original scheme. By means of these, men and cattle could readily enter the enclosure in troublous times, and doubtless these small openings would be subsequently effectively barriered.

As to the construction of the mound, naturally the material excavated would be used to some extent. But in an excellent section, cut right across, during the alteration of the road from Flamboro' station to the village, a few years ago, it was clearly evident that at least the upper part of the mound was constructed of sods of grass. Under favourable conditions, especially in wet weather, these can still be seen, the parallel lines of the roots of the grass being visible. As to the time occupied in making the mound and ditch, and the number of men employed, we have, of course, no knowledge. But when it is borne in mind that the only tools then available were picks made from deer-antlers, and basket-work or hide receptacles for carrying the material excavated, it will be understood that the labour involved must have been stupendous, and clearly this district was then much more thickly populated than it is to-day.

With regard to the date of this earthwork, it is certainly much earlier than the occupation of this country by the Danes. Its shape and method of construction demonstrate that it is not Roman, a fact supported by the absence of any Roman relics on its site. In considering this question, we cannot disassociate Danes' Dyke with the remainder of the entrenchments which form a net-work over the Wold area to the west, about 80 miles of which were mapped by the late J. R. Mortimer. Six miles away, and parallel with Danes' Dyke, are the Argam Dykes, a double set, not so massive, but much longer. Then the north, south, and west edges of the Wolds are protected by earthworks, many miles in length, and sometimes in two, three, four or five parallel series. In addition to the escarpments, the fresh-water springs are also protected by entrenchments.

In the same area, and associated with the earthworks, are the barrows, or burial mounds, several hundred of which have been examined. Of the date of these there is no question. The contained implements, weapons and ornaments prove that the mounds belong to the Bronze Age.

Now it is evident that the barrows were built before the smaller entrenchments, as at Aldbro' and other places, the direction of an entrenchment has been diverted in order to avoid a burial mound. And as the barrows are of the Bronze Age, it is clear that the earthworks cannot be earlier than that period. However, the intricacy and elaborate nature of the westernmost earthworks, together with the fact that they become more massive and simple in design as we travel eastward, give support to the idea that probably the Danes' Dyke is the oldest; then the Argam Dykes were built, and further series were erected as the builders travelled westward.

An earthwork of another kind, but still extraordinarily substantial, is at Skipsea Brough, a few miles south of Bridlington. Here a large mound, 70 feet in height, covering four acres, is surrounded by a small ditch and rampart, and then some distance away are enormous earthworks in semi-circular form.

Close to these earthworks, at Ulrome, are the remains of a Lake Dwelling, one of the oldest in the British Isles. It was discovered by the late Thos. Boynton many years ago, while excavating a drain. On the side of the drain several oak piles and other material had been thrown out, and also some bones which had been artificially bored, apparently for the insertion of a wooden handle. A careful investigation was then made, with the result that it was soon ascertained that a platform of no mean extent had been discovered, right through which the drain had been cut. At a depth of about three feet a large quantity of twigs and branches, covered with a layer of sand and bark, was reached, forming a floor, and this rested upon a platform composed of tree trunks laid together, side by side; these were of oak, ash, willow, birch, alder and hazel. The diameter of the logs varied from one to one-and-a-half feet, and they were from 15 to 20 feet in length. The structure was held together by upright piles driven through the brushwood and between the trunks. At the outer edge of the platform some stakes were driven in a slanting direction, evidently with the view of better holding it in position. Another thick layer of brushwood occurred below the timbers, and this rested upon the peaty bed of the lake, two feet in thickness. Below this was the original gravelly bottom.

The platform measured 90 feet in length by 60 feet in breadth, and was connected with the land at each end by a causeway, which was about 20 inches below the top of the structure, a fact which seems to show that it was erected by the first inhabitants. There were two different settlements on the sites.

The piles were principally of oak, and were usually three

or four inches in diameter. There were two kinds, one with rounded and blunt points, whilst the others had clearly been sharpened with a metal instrument. It was also noticed that the blunt ones were those originally driven into the lake bed, the sharpened piles frequently cutting the timbers of the lower structure. This clearly indicated two distinct periods of occupation, represented by two platforms, one above the other, the latter having evidently been erected at a time when metal was in use, and upon a fascine dwelling which was of great age and much decayed when the new one was built. The finding of a single bronze spear-head amongst the brush-wood in the later structure also confirms this view, and indicates that it had been built by the Bronze-age Britons. A fragment of a jet arm-band was found on the same horizon. The implements in the lower dwelling consisted of scrapers, saw, knives, etc., made of flint ; hammer stones and anvils of stone ; hoes, picks, and other agricultural implements, made of bone or horn.

The tumuli or burial mounds in the Bridlington district have been excavated by the late Canon Greenwell and the late J. R. Mortimer, with the assistance, in some cases, of the late Thos. Boynton ; and a few which these antiquaries had not examined have been excavated by the present writer. These burial mounds have yielded an enormous number of interesting relics, including earthenware vessels of various kinds ; crudely decorated hammers, axes, spears, daggers, etc., of stone and flint ; daggers, knives, etc., of bronze ; and ornaments of jet and amber and other materials. The Greenwell and Boynton Collections have been distributed, but most of the important specimens at any rate therefrom can be seen in the British Museum, or the York Museum. The enormous numbers obtained by Mr. Mortimer, however, are now at Hull, the Mortimer collection having been purchased for the Hull Corporation by Col. Clarke.

With regard to the Neolithic implements, these have been described in detail by the present writer in *The Naturalist* for August, 1910. The material from which most of the East Yorkshire specimens have been made is of a tough, dark-coloured flint, which is very different indeed from the light-coloured splintery flint which occurs in the Yorkshire Chalk. It is clear that the Neolithic implements are wrought from the far-travelled boulders of black flint which occur in the glacial clays and gravels, and which have been derived from the bed of the North Sea, or from the land on the eastern side thereof. It occurred to the writer that the early inhabitants of East Yorkshire would probably come to the coast for the material for making their implements, as the absence of natural exposures where the boulders could occur in large

quantities would prevent these primitive people from getting their supplies inland. For years, consequently, watch has been kept all along the Holderness coast for anything approaching the appearance of a Neolithic workshop. Whilst it is probable that such have existed, there can be little doubt that all trace of them has disappeared as a result of the erosion by the sea. Seeing that on an average no fewer than seven feet per annum have been denuded, it will be understood that since prehistoric times a considerable tract of country must have been swept away, and that consequently the sites of any workshops, which would naturally be upon the cliff edge in those far-off days, are now some miles out to sea.

In the vicinity of Bridlington, the retreat of the land is nothing like so rapid, and where, as north of the town, the cliffs are protected by a natural breakwater of solid chalk, erosion is comparatively slow. In such a situation, therefore, it seems highly probably that sites of the implement manufactories might exist. During the past few years I have had opportunities of examining the district, and have been successful in finding at least four distinct places where unquestionably primitive man made the crude flint weapons and tools with which he hunted and fought. Two of these sites are south of the town, and two north, one being quite close to Danes' Dyke.

The positions of these, the earliest of our known workshops, were first recognised by the enormous number of dark-coloured flint boulders, pebbles and splinters which occurred. Each occupied the top of a slight rise in the ground. A close examination showed that, whilst a few of the larger pieces of flint were in their natural state, or only slightly chipped, others were in various stages of manufacture, from the split nodule with squared edges, to the small conical cores, chipped all round, which had been thrown away, simply because with their primitive tools our early ancestors had been unable to strike any further flakes off. In all directions were the spoilt flakes or 'wasters,' as well as 'flake-knives,' the edges of which are remarkably sharp. Occasionally a piece of flint was found which had some flaw, or was in other ways unsuitable for making into good implements, and had been discarded after several attempts had been made to put it to good purpose. In some cases it was clear that a large flint nodule had been entirely chipped to the core, as peculiarities in the texture of the flint could be detected in the dozens of pieces around. Of course, the best flakes would be made into finished implements and be taken away. In addition to the cores and flakes, however, a number of complete and well-finished Neolithic implements have been found, which had been accidentally lost, or for some other

reason had been left behind. Among them are some types which are quite peculiar to the district, and, except in a few isolated instances, are not found in any other part of the country.

The commonest form of implement found was the oval or pear-shaped 'scraper,' the circular form which occurs in thousands on the wolds to the west being only occasionally met with near Bridlington ; and, so far, not at all on the sites of these workshops. The long scrapers average about two or two-and-a-half inches in length, by about one-and-a-quarter inches in breadth. One side is almost flat, just as struck from a nodule, and shows no secondary chippings. The opposite side, however, exhibits evidence of careful workmanship. Usually the end opposite the 'bulb of percussion' (made in striking the flake from the block) is semi-circular in form, and rendered sharp by many small secondary flakings, skilfully made. In addition, one of the long edges is usually flaked in the same way. These are thought by some authorities to have been used for striking lights, after the manner of the flint and steel of our great-grandfathers' days. By others they are considered to have been used for scraping the fat, etc., from the skins of animals. Probably the former view is the more correct.

Another type of weapon, which is by no means uncommon, is not so easy to account for, unless it has been used for making or straightening arrow and spear shafts. These vary in shape, but are usually portions of large, well-struck, triangular flakes, the ends of which have been broken away. At first they may easily be passed over as ordinary 'wasters,' but a closer examination reveals the fact that at the ends, or sides, or both, there are small semi-circular notches with innumerable small flakings from one side only, thus leaving a sharp cutting edge, just such as would be necessary for working an arrow shaft. Of this particular type of implement (which has not hitherto received the attention it deserves) quite a number has been obtained.

Of the barbed arrow-heads which have been found in such numbers in the Driffeld and Fimber neighbourhoods, not a trace has been seen, though more or less complete arrow-points and small spear heads of the lanceolate or leaf-shaped type have been obtained. Although the barbed arrow-head is not nowadays common anywhere, its entire absence on the site of the four workshops is a little difficult to explain.

Perhaps the most remarkable find is a curved implement in the form of a boomerang, and is considered by the authorities at the British Museum to have been used as a sickle. It was found at Bempton by a labourer whilst ploughing. It most resembles one of the long, well-made flint axes, which are

occasionally obtained on the Wolds, but has a remarkable curve, or elbow, in the middle, which, of course, precludes it from being classed as an axe-head. Both sides are carefully chipped to a sharp cutting edge, and one end is also sharpened after the manner of an axe.

There are two other important types of Neolithic weapons which are peculiar to the Bridlington district, a fact which would seem to show that the place was evidently of some importance in prehistoric times. One is a large triangular arrow- or spear-head, sometimes with a projection at one corner. Its principal feature, however, is the extraordinary way in which the flakes have been struck off parallel to each other, and extend across the implement without a break. These regular flakings have resulted in the name 'ripple-marked' being given to this class of implement. Oddly enough, as in the case of the curved flint weapons, the nearest approach to the Bridlington ripple-marked spear-heads occurs in Denmark and Egypt.

The other weapon is a conical axe-head, usually made from diorite or other allied igneous rock, which does not occur in situ for many miles. Like the black and pink flints, the material for making these axe-heads has undoubtedly been obtained from the transported erratics in the glacial clays and gravels. Unlike the generality of East Yorkshire Neolithic axe-heads, these Bridlington examples have a point at one end, the broad end being rubbed down to a sharp cutting edge. They are circular, or nearly so, in section, and are frequently very much weathered. Specimens of this type which have been examined in various museums and collections up and down the country have invariably proved to have been obtained in the Bridlington district.

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Thirty-six Country Rambles Round Leeds, by Fragrant Wood and Scented Meadow Path, by John Hornby. Leeds : Wm. Brierley. 109 pp., 1/- net. The fifth edition of this work has appeared. It contains numerous illustrations and well-written descriptions of various rambles in the Leeds district, which should be equally interesting to the people of Leeds as to visitors to the city.

The Story of the Maize Plant, by P. Weatherwax. University of Chicago Press, \$1.75, xv.+247 pp. This interesting and well-illustrated book professes to be 'the only complete modern exposition of the morphology of the maize plant. In this volume Mr. Weatherwax is interested in giving a well-balanced, reliable summary of our present botanical knowledge of maize. He eliminates the influence of the economic point of view and describes maize as a plant, with problems of its own to solve, a life of its own to live, and a part of its own to play in the drama of organic existence. His treatment of the biological individuality of maize is accompanied by a brief discussion of the influence of corn upon ancient and modern American civilizations, and the reciprocal reactions of human activities upon the plant.'

REVIEWS AND BOOK NOTICES.

Seaside and Countryside in East Anglia is a charmingly written and well-illustrated pamphlet issued by the advertising department of the London and North Eastern Railway Company at the low price of sixpence. Its object is to draw attention to the attractions of the district referred to in the title, and this it certainly does admirably.

A Perthshire Naturalist : Charles Macintosh of Inver, by **Henry Coates**. London : T. Fisher Unwin, xx.+244 pp., 18/- net. Mr. Coates has done his best to keep the memory of Charles Macintosh green. Mr. Macintosh was one of the founders of the Perth Museum, and in giving an account of his life and work, the author has gathered together many interesting anecdotes, and incidentally adds considerably to our knowledge of the natural history of the area familiar to the subject of his Memoir. The book is very pleasantly written and has introductions by Dr. J. A. Thomson and Professor Patrick Geddes.

Sedimentary Petrography, by **H. B. Milner**. London : T. Murby & Co., 125 pp., 8/6. Now that considerable attention seems to be given to the Petrography of Sedimentary rocks, it appears appropriate that Mr. Milner should have produced a little volume giving an account of the methods to be adopted in separating minerals, and in describing the general steps to be adopted for the Sampling, Treatment and Microscopical Examination of Detrital Sediments ; The Crystallographical, Physical and Optical Properties of the principal Detrital Minerals ; The Principles and Practice of Correlation of Sediments by Petrographic Methods ; and The Bearing of Sedimentary Petrography on Palæogeographical Problems. The researches of Sorby resulted in the foundations of this particular subject being laid, but an idea of the principal works by other writers can be gathered from the Bibliography at the end of the book. There is also a table showing the ' Distribution of the Chief Detrital and Associated minerals in certain British strata.' The price seems rather high for a small volume of this sort, but possibly the publishers anticipate a limited sale.

Elements of Plant Biology, by **A. G. Tansley, M.A., F.R.S.** George Allen and Unwin, pp. 410, 10/6 net. This is one of the most helpful contributions to the study of the elements of biology which has appeared in recent years, and is the result of many years' experience in giving courses in biology for the preliminary examination in science and the first M.B. degree at the Cambridge Botany School. As such students, as a rule, do not intend to continue the study of botany, emphasis is laid on biological facts of general significance, and only limited space is devoted to questions of morphology. Attention is directed rather to what plants can teach them about life as a whole, rather than to a knowledge of plants for their own sakes. The course begins with the use of the compound microscope and the structure of the cell as the organic unit, followed by a chapter on organic substances and their chemical characteristics. Unicellular animals and plants are then studied, leading up to filamentous and higher forms, the origin of sex, the plant body and differentiation of tissues, and finally to a study of seed plants. The author's outlook, repeatedly emphasised, is that all phenomena of life depend upon the chemical and physical composition and structure of protoplasm ; the two most fundamental properties of the latter being (1) its power of maintaining the equilibrium of its physical structure within a certain range of external conditions ; and (2) its power of assimilation which is the basis of growth and reproduction. These powers make protoplasm a unique substance in nature, and what we call life, a unique phenomenon. Though the experience of some teachers may not support the results indicated in one or two instances, Mr. Tansley has produced a work of real value, not only to students, but to teachers of biology in general, and his daughter is to be congratulated on the clearness of the numerous figures with which the work is illustrated.

YORKSHIRE NATURALISTS AT BRIDLINGTON.

W. H. PEARSALL, D.Sc., AND F. A. MASON, F.R.M.S.

IN connexion with arrangements made for this excursion (the 305th Meeting of the Union, April 21st-23rd), the local Secretary, Mr. J. W. Stather, is to be congratulated on enlisting the services of two members so thoroughly familiar with the district as Messrs. J. T. Flintoff and M. Lawson. For more than ten years these enthusiastic naturalists have kept careful detailed records of the natural history, particularly of the plants, of the Flamborough peninsula. Their intimate knowledge of the area to be examined prevented any waste of time, and the excursions were so well planned that the programme was completed by the end of the second day.

On Saturday, a party of geologists under the leadership of Messrs. T. Sheppard and J. W. Stather, afterwards joined by Prof. A. Gilligan and Mr. H. E. Wroot, were fortunate in being able to examine the deposits of an ancient mere, temporarily exposed during improvements at present being effected by the Corporation of Bridlington. It was this mere which gave Marton its name, and it was in the deposits of the same mere that the Swedish botanist, Nathorst, first found in Britain plant remains of the arctic vegetation which occupied the land immediately the Ice Age passed away. On the completion of the present operations the deposits will again be hidden, perhaps for many generations to come.

The base of the cliff at Sewerby, and for some distance towards Flamborough, was also investigated with satisfactory results, as will be gathered from Messrs. Stather's and James' notes below.

Meanwhile, another party visited Flamborough Head, with Mr. J. Fraser Robinson, and the guides before-mentioned, going *via* Sewerby, a walk much enhanced by permission to visit the gardens and woods on the estates of Mr. G. Lloyd-Greame and Mr. Gain respectively. Mr. Robinson's report deals with this part of the programme.

A General Meeting was held at Headquarters the same evening, at which Mr. T. Sheppard, M.Sc., a past President of the Union, occupied the chair. Sectional reports were presented, and votes of thanks to land-owners who had so kindly given facilities to members at Sewerby, Marton and Boynton, as well as to the leaders and guides, were unanimously accorded. Twelve new members were elected.

At the close of the General Meeting, Mr. Sheppard gave a lecture on 'Prehistoric Implements from Bridlington,' which was full of local, as well as of wider interest, illustrated by specimens of prehistoric craft. We understand that this lecture is to appear as a paper in *The Naturalist* (see pp. 197-203), and anticipation of its contents here would merely invite the use of the blue pencil. This lecture was followed by another on 'The Glacial Features of Flamborough Head,' by Mr. J. W. Stather, in which he outlined the discoveries which led up to present views on the subject of glaciation. This also was well illustrated by specimens, which greatly added to the interest of an altogether delightful account of the unique geological features of the East Riding.

The following day saw the geologists at Speeton, and the remaining portion of the party at Boynton, where a very pleasant and not unprofitable day was spent. In the evening, members had the opportunity of listening to what Mr. Robinson himself would prefer to call a 'talk' rather than a 'lecture' on the 'Flora of Flamborough.' Mr. Robinson said that of the 1070 plants known to inhabit the East Riding of Yorkshire, about seven-tenths of them find a natural home on the Flamborough peninsula. Not included in the list of natives, but still very interesting to the botanists, were some of the aliens which had made themselves very much at home. Some member of the family of the owners of the beautiful Sewerby estate, to which the party had privileged access, seems

to have collected into a wild part of the grounds many souvenirs of travel in the shape of Alpine and sub-Alpine plants. The members had the pleasure of seeing banks of the delightful sky-blue Appenine anemone in full bloom, and among the rarer English plants, the little yellow *Anemone ranunculoides*, and there were many natural hybrids of primrose and polyanthus. Among the actual native plants the rarest of all is the little *Adoxa moschatellina*. In the West and North Ridings, rather curiously, the plant is so common as to hardly excite notice, although this one situation near Sewerby is the only place in the East Riding where the plant condescends to grow. The most puzzling find was the common garden parsley in an old quarry, which it had quite overgrown. Why and how did it come there? It was too far from human habitation for garden refuse to have been dumped, and the matter remained a mystery till someone learned in country ways remembered that poachers sometimes sowed parsley to encourage hares!

It is to be regretted that space will not permit a fuller account of Mr. Robinson's remarks, and we can only express the hope that his wide knowledge of plant life in the East Riding will some day be given to botanists in the form of a sequel to his published 'Flora.'

GEOLOGY (J. W. Stather):—The geologists had a good time. On Saturday the well-known, but always interesting coast sections between Bridlington and Danes' Dyke were visited.

POST-GLACIAL LAKE.

Attention was first directed to a post-glacial lacustrine deposit near Sands Cottage, through which a shallow cutting for a new road had recently been made. The exposure was only a poor one, but was interesting because in this locality Dr. Nathorst first recorded the Arctic plants (*Betula nana*) etc.

THE SEWERBY GLACIAL BEDS.

As the party passed northward along the beach towards Sewerby, unusually clear sections in the wasting cliffs were noted. Two distinct boulder clays, probably basement and purple, were seen, capped by chalky gravels of later date.

THE SEWERBY BURIED CLIFF.

Opposite Sewerby village, the eastward end of the buried pre-glacial chalk cliff of Holderness emerges from behind the glacials into the light of day, and the party was favoured by the sight of a good exposure of the old beach and its associated deposits. A man recently gathering shingle in this locality picked up a large fossil tooth, which was exhibited by Mr. Major Lawson at the evening meeting, and pronounced by Mr. Sheppard to be the lower part of the tooth of the extinct elephant, *Elephas antiquus*. This deposit was investigated in detail and reported upon in *Rep. Brit. Association* for 1888.

THE CHALK OF SEWERBY CLIFFS.

This chalk is without flints, has many marly partings, and of its fossils, Dr. A. Rowe writes*:—"The zonal fauna of this chalk is one which is certainly without parallel in the rest of England," The beds dip slightly to the south, and in the 1400 yards of cliff between Sewerby cliff end and Danes' Dyke, there is exposed an unbroken sequence of strata 240 feet thick—the upper 177 feet being placed by Dr. Rowe in the zone of *Actinocamax quadratus*, and the lower 63 feet in the zone *Marsupites ornatus*.

Although several hours were spent in searching the cliffs and scars, *A. quadratus*† was not seen, but its near relative *A. granulatus* was fairly abundant. On the other hand, *Inoceramus lingua* was found to

* *Proc. Geol. Assoc.*, 1904.

† See *The Naturalist*, 1911, p. 152.

be commoner throughout the sections and we agree with Dr. Rowe's suggestion, that in the absence of or exceeding scarcity of *A. quadratus* in Yorkshire, *Inoceramus lingua* should be regarded as its zonal equivalent. It is also of interest to note that this *Inoceramus*, though abundant in Yorkshire, is found nowhere else in England, but is common at the same horizon in Germany.

The find of the day, however, was made by Mr. T. Sheppard, who detected a single specimen of *Avicula tenuicostata*, a great rarity in Yorkshire chalk, in a bed of shaly chalk at the base of the cliff 100 yards west of the first of the large blocks of cemented chalk rubble, west of Danes' Dyke.* About midway between Sewerby and Danes' Dyke a fine exposure of the famous Flamborough Sponge beds was seen, and had time allowed, good specimens in great variety could have been secured. We are also able to record *Cardiaster ananchytes*, *Echinocorys vulgaris*, *Cidaris* sp., *Bourgueticrinus*, *Ostrea* sp., *Ventriculites*, *Marsupites ornatus*, *Porosphaera*, from the Sewerby sections.

The geologists who stayed over the week-end, were motored by members of the Union resident in the district, to several points of geological interest round Flamborough Head. They visited Speeton, and also had an opportunity of seeing the splendid examples of marine denudation of Selwick's Bay and High Stacks, and the blow-holes and glacial beds under the lighthouse. The heavy capping of Drift in this vicinity is largely composed of re-arranged Speeton clay, pushed up by the ice in its southern progress, so that characteristic Lower Cretaceous fossils can be collected above the chalk.

BOTANY (J. F. Robinson):—A fact which undoubtedly contributed much to the successful week-end enjoyed by the botanical section was the preliminary arrangement of the programme, and the subsequent guidance in the field by Messrs. R. J. Flintoff and Major Lawson. The present writer has had the privilege of perusing quite voluminous MS. records of their combined observations on the flowering plants found round Bridlington, and finds that many new stations and even new plant species have been added to the Flora of the East Riding of Yorkshire (Watsonian Vice-county 61) by their efforts.

Thus it was a great advantage to be taken by these men, on a sunny but somewhat chilly April morning, over the estates at Marton and Sewerby. These lie partially in a depression, in the lowest part of which there are still springs and ponds—relics of a formerly more extensive mere. Now, most of the neighbourhood is well drained and wooded with a luxuriant undergrowth of herbaceous vegetation, decidedly dominated by the Lesser Celandine or Pilewort (*Ranunculus Ficaria*). The feature, however, which chiefly took the attention of the botanists was the large assortment of plants that had been introduced from abroad, and are now thoroughly well established and naturalised, not merely in the plantations, but frequently also by the roadsides and in the adjacent fields. There were Winter Aconite (*Eranthis hyemalis*), many clumps of the true Aconite or Monkshood (*Aconitum Napellus*) and big beds of the two alien Butterburs (*Petasites albus* and *P. fragrans*), Sweet Cicely (*Myrrhis odorata*) was common and just coming into flower, while her umbelliferal congener, the Giant Cow-parsnip (*Heracleum giganteum*), the largest of herbaceous biennials, was already big, but not a sixth of the height it will be at its flowering period a couple of months hence. The East Riding has the credit of being the premier place of settlement of the last-named species, for it was introduced from Siberia in the mid-decades of last century by the agency of a Hull naturalist, the late George Norman.

On wall tops between Marton and Sewerby our little native Bittercress (*Cardamine flexuosa*) was growing plentifully, replacing almost entirely the ordinary species, *Cardamine eu-hirsuta*.

* The writer has since obtained a further specimen in the same place.

The beautiful estate of Mr. Lloyd-Greame at Sewerby, closely adjacent to that visited at Marton, afforded a further revelation, and to a still greater degree, of the luxuriance and beauty of several other exotic species. Particularly were the visitors struck by the cerulean masses in full flower of the blue Mountain Anemone (*Anemone apennina*) that seems perfectly at home here, as well as does its yellow relative, *Anemone ranunculoides*. Both of these have foliage very similar to that of our native and well-known wind flower (*Anemone nemorosa*) which, however, though sparingly present and in flower at Sewerby, is apparently being ousted by the vigorous incomers, especially *A. apennina*. The two butterburs above mentioned for Marton and the roadsides are in still greater abundance near the anemones, and several other exotics are equally at home. The Cyclamen (*C. europæum*), Lungwort (*Pulmonaria officinalis*), whose white-spotted leaves drew from one of the guides a little dissertation on the 'doctrine of signatures,' held by the mediæval herbalists, Snake's-head Lily (*Fritillaria meleagris*), and, very sparingly, the uncommon floral beauty known as the Dog's-tooth Violet (*Erythronium Denscanis*) were all found growing with the indigenous Sweet Violet (*Viola odorata*), the tuberous Moschatel (*Adoxa Moschatellina*), Ground-Ivy (*Nepeta hederacea*), Wood Forget-me-not (*Myosotis sylvatica*), the early Purple Orchis (*O. mascula*), the larger Twayblade (*Listera ovata*) and very occasionally the Bluebell or Wild Hyacinth (*Scilla non-scriptus*).

It was pleasant to notice the *Adoxa* above-mentioned in this quarter, as previously there was no record of it in our local Flora except in two places on the extreme north of the Riding, near York and Kirkham Abbey.

To a beech wood on a chalky slope, dipping towards the depression, other parts of which had been explored, a kindly gamekeeper conducted the party, and there they had a view of beds of Daffodil (*Narcissus Pseudo-narcissus*), and much growth of the Sweet Violet in flower, completely carpeting the ground, together with a few bushes of the Stinking Hellebore (*Helleborus fœtidus*).

Among many fine trees on the Sewerby estate, the Monkey Puzzle (*Araucaria imbricata*) flourishes well and matures fertile seeds, as fine seedlings thereof raised by the gardener showed conclusively.

After a halt for refreshments at Flamborough village, a detour was made *via* Flamborough Grange towards Thornwick Bay. In an old, disused chalkpit it was interesting to notice a large growth of Parsley (*Carum Petroselinum*) emerging from joints and cracks in the chalk strata. Although an introduced species, Parsley is rarely found wild or so well naturalised as it is here. Messrs. Flintoff and Lawson have known of it in this station for several years, and as it is quite remote from gardens, they have wondered much as to its original introduction to this particular spot. The probability is that illicit lovers of ground game, which are known to be partial to the aromatic umbellifer, had sown its seed in the first instance in the cultivated fields near by.

The pleasantly undulating sward that was traversed in approaching the cliff edges of Thornwick was dominated by an immense growth of Earth-nut, or Pig-nut (*Conopodium majus* vel *Bunium flexuosum*), not yet, however, in flower. The two ferns, Moonwort and Adder's Tongue, seen on former visits, were not yet showing; but in several places on the headland the Gorse, Whin or Furze (*Ulex europæus*) appeared in all its golden glory.

Marshy places in the small ravines that descend to the 'wicks' proper, yielded the Common Scurvy Grass (*Cochlearia officinalis*) and *Equisetum limosum*, while on drier parts were *Viola Riviniana*, Thrift (*Armeria vulgaris* vel *Statice maritima*), all the Plantains, including *Plantago media*, *P. maritima* and *P. Coronopus*, and the Sea Mouse-ear Chickweed (*Cerastium tetrandrum*), a very old record again confirmed.

Most of the following day was spent in the Wold Woods and the valley of the Gypsey Stream, at and in the neighbourhood of Boynton, which was approached by way of the old road known as Woldgate. Here the Blackthorn or Sloe (*Prunus spinosa*) and the 'Gean' or Wild Cherry (*Prunus avium*) were in full blossom, while below the tangled shrubbery of the roadside the flowers of Herb Robert (*Geranium Robertianum*) and the spathes of 'Lords and Ladies' (*Arum maculatum*) were just beginning to show themselves. Here also the dry, straggling stems of last season's growth of Old Man's Beard or Traveller's Joy (*Clematis Vitalba*) were to be seen in the well-known station which is probably its most northerly one in Great Britain.

Of the arboreal vegetation, or that of the undergrowth in the Boynton Woods, it would be superfluous to speak after the present writer's sectional report of the 1912 Meeting at Bridlington (*The Naturalist*, 1912, pages 211-214), and the excellent and exhaustive article 'Plant Associations of Flamborough Head' by Dr. T. W. Woodhead in the same journal, 1912, at page 219. Not, however, recorded previously, mention may be made of the fact that also at Boynton are several certainly introduced plants which have become naturalised in Pond's Wood. As examples may be given, Kidney-leaved Saxifraga (*Saxifraga Geum*), a Leopard's Bane (*Doronicum*), Monkshood (*Aconitum Napellus*); and, in the churchyard, a burial place of the 'Stricklands' of Boynton, a big bed of *Anemone ranunculoides* just past the prime of its showy flowering-time was pointed out. One wondered as one stood by the tomb of that Strickland, who is said to have been the original of the boy naturalist, 'Martin,' in 'Tom Brown's Schooldays' how far he was responsible for the presence of so many alien plants in this district.

At this season the Gypsey Race is a very fine, clear, considerable stream, but except for a good display of Marsh Marigold (*Caltha palustris*) on the marshy ground through which it sometimes runs, there were not many other flowers to be noted.

The undergrowth in the beech wood that was entered after a short walk along the Gypsey was very largely made up of Herb Bennet (*Geum urbanum*), Wood Sanicle (*Sanicula europæa*) came next, and only occasionally, in small patches, Red Campion (*Lychnis dioica*), a feature so different from that obtaining in plantations and woods nearer Flamborough. In Pond's Wood the first distinctly dominant herbaceous plant was Enchanter's Nightshade (*Circea lutetiana*).

As a result of last year's large crops of fruit and the mildness of the past winter season, there is now an immense number of seedlings everywhere, particularly of Giant Cow-parsnip, Sycamore, Beech and certain Conifers.

'Of a thousand seeds she brings but one to bear' can scarcely be said for nature in Boynton woods this spring of 1923.

MARINE ALGÆ (C. H. James).—Although it was somewhat early to find seaweeds at their best, a number of species was observed, and the list may be useful for comparison with those known to exist at Scarborough and elsewhere on this coast. Most of the following algæ were taken in the rock pools under Sewerby cliff, some nearer to Flamborough (F.) and the remainder towards Bridlington (B.). In spite of the recent gales, some of the larger red algæ like *Rhodymenia palmata* were in splendid condition. Curiously enough, *Himanthalia lorea* was not seen, although it was expected to occur in this neighbourhood. The *Desmarestia* occurred as the winter form, buried in sand near low water mark. *Callithamnion brachiatum* and *Corallina* were very abundant. The asterisked species had tetraspores present.

GREEN.

<i>Cladophora arcta</i>	(F.)	<i>Enteromorpha compressa</i>	(F. & B.)
<i>C. lœtevirens</i>	(F.)	<i>Ulva latissima</i>	(F. and B.)
<i>C. rupestris</i>	(F. and B.)		

BROWN.

<i>Ascophyllum nodosum</i>	(F.)	<i>Fucus vesiculosus</i>	(F. and B.)
<i>Cladostephus spongiosus</i>	(F.)	<i>F. serratus</i>	(F. and B.)
<i>Desmarestia aculeata</i>	(B.)	<i>Laminaria digitata</i>	(F. and B.)
<i>Ectocarpus fasciculatus</i>	(F.)		

RED.

<i>Callithamnion floridulum</i>	(F.)	<i>Laurentia pinnatifida</i>	(F.)
<i>C. brachiatum</i> *	(F.)	<i>L. pinnatifida</i> var. <i>littoralis</i>	(F.)
<i>Ceramium acanthonotum</i> *	(F.)	<i>Melobesia lichenoides</i>	(F.)
<i>C. diaphanum</i>	(F.)	<i>Plocamium coccineum</i>	(F.)
<i>C. rubrum</i>	(F. and B.)	<i>Polysiphonia fastigiata</i> *	(F.)
<i>Corallina officinalis</i>	(F. and B.)	(On <i>Ascophyllum</i>).	
<i>Chylocladia articulata</i>	(F.)	<i>P. nigrescens</i> *, on <i>Laminaria</i>	(F.)
<i>Delesseria alata</i> *	(F.)	<i>P. pulvinata</i>	(F.)
<i>Dumontia filiformis</i>	(F.)	<i>Porphyra lacinata</i>	(F.)
<i>Gigartina mammelosa</i>	(F.)	<i>Ptilota elegans</i>	(F. and B.)
(Early capsules).		<i>Rhodymenia palmata</i>	(F. and B.)

MYCOLOGY (F. A. Mason).—Flamborough :—It was too early in the year for agarics, and it was not surprising that only two or three common species were noted. A few specimens of *Tricholoma gambosum* were collected on the grassy slopes of Flamborough Head, their appearance at this time justifying the popular name, St. George's Mushroom, which, according to tradition, is due on St. George's Day, a date within the period of the present excursion. Polypores were equally scarce, *P. squamosus*, *P. versicolor*, and *P. hirsutus* reported by Mr. A. E. Peck, being the only species seen.

What time could be spared from secretarial duties was devoted by the writer to the collection of inconspicuous species of fungi occurring on leaves, dead herbage, rotten sticks, etc., with some success. In addition to the common Uredines on celandine, dandelion and violet, *Puccinia Iridis* was found on *Iris fœtidissima* in abundance. This fungus has not previously been reported from the East Riding, and there is no record of it having occurred on *I. fœtidissima* in this county. Whilst the lower portions of the leaves bore the pustules of the Uredine, the apex of the blade, in many cases, proved to be the habitat of two other fungi, a Hypomycete seen only once in the county, at Mulgrave, 1914, and a Cœlomycete, which, so far, had altogether escaped the attention of Yorkshire mycologists.

In an ash plantation on the estate of Mr. Lloyd-Greame, at Sewerby, the trees were badly affected by 'canker,' and close observation of the trunks revealed the minute perithecia of *Nectria ditissima*, the fungus responsible for this disease. Fallen samaras of the ash provided a habitat for two species, the common *Phoma samararum* and a *Phomopsis* listed below. The Jew's-ear fungus, *Auricularia auricula-Judæ*, occurred frequently on elders on the same estate.

Boynton :—From the viewpoint of Yorkshire mycology, Boynton must be regarded as classic ground. Here, between the years 1874 and 1882, before Massee had made a mycological name for the Scarborough district, Walter W. Strickland collected and studied the fungi of the neighbourhood. His collection, numbering more than 200 species, not including the commoner agarics, mostly from Boynton, was afterwards presented to the British Museum, where it still remains. A full list of species was published in *The Naturalist*, 1889, pp. 183-198, together with some introductory remarks on mycology in general. Although more than thirty years have elapsed since this Boynton mycologist wrote his notes, they embody suggestions for investigations that might well occupy, and, indeed, are occupying the attention of mycologists to-day.

The woods at Boynton are mixed deciduous, oak, elm, and ash,

much planted with conifers, and they provided a few species of fungi of special interest. On larch cones were found *Cenangium ferruginosum*, *Dothichiza ferruginosa*, and a form of the ubiquitous *Dasycypha virginea*, characterised by a pink tint. The ash trees were here also attacked by 'canker'; elms, in several cases, were rendered unsightly by hyperplasia excrescences, and a birch on the edge of the park was festooned with 'witch's brooms,' varying in diameter from an inch or two to two feet. The general impression gained from the condition of the standing timber was that whilst the conifers were healthy, the deciduous trees were not at all happy. On fallen timber, *Poria sanguinolenta* was abundant. *Corticium subcoronatum*, found in the Riding during the joint Foray of the Yorkshire Naturalists' Union and British Mycological Society, at Selby in 1918, also occurred, along with two species of mycetozoa, *Arcyria denudata* and *A. pomiformis*.

In Boynton Park, Mr. Peck secured a fine specimen of *Mitrophora gigas*.

Confirmation of an exceedingly interesting observation regarding the occurrence of *A. (Hirneola) auricula - Judæ* on the common barberry, recorded by Mr. Fraser Robinson (*The Naturalist*, 1912, p. 412) was obtained on this visit to Boynton. An unusually large and obviously ancient bush standing by the corner of the churchyard still served as the habitat of this fungus. Although, as mentioned above, the Jew's-ear occurred on the elder at Sewerby, only a few miles away, no specimens were found on trees of that kind at Boynton. It is worth noting in this connection that C. Rea (*British Basidiomycetæ*) records its occurrence on *Berberis arcuata*.

The following list contains the more uncommon species obtained during the two days' excursions:

NEW TO S.W. DIV., V.C. 61.

Puccinia Iridis Wallr., on *Iris fætidissima*, a new Yorkshire host, Sewerby.
Cladosporium fasciculare Fr., on withered tips of leaves of *I. fætidissima*, Sewerby.

NEW TO YORKSHIRE.

Pleospora socia Sacc. and Pass., on dry pods of *Cytisus scoparius*, Flamborough. Along with this fungus was a cœlomycete to which I drew the attention of Mr. W. B. Grove, and with reference to which he says: 'The Cœlomycete is doubtless the pycnidium of the Pyrenomycete, but I have seen no description or name for it.'

Cenangium ferruginosum Fr. f. *Laricis*, on cones of *L. europæa*, Boynton.
Dothichiza ferruginosa Sacc., on same cones as the last mentioned species.
Phyllosticta Pseudacora Brun., on withered tips of leaves of *I. fætidissima*, Sewerby.

Phomopsis pterophila Died., on samaras of *Fraxinus excelsior*, which it inhabits more particularly at the seed end, *P. samararum* occupying the wing, as it did in the case of the Sewerby specimens.

I am indebted to Mr. Grove, who has examined and, in most cases, determined the species in this list, and to Mr. A. Clarke for advising me with reference to their occurrence or non-occurrence in the records of the Yorkshire Mycological Committee.

VERTEBRATE ZOOLOGY (C. F. Procter).—The members of the Vertebrate Zoology section were perhaps the greatest sufferers from the cold north-east winds which prevailed on Saturday, April 21st, and the Sunday. Birds were inclined to keep to cover, but the weather on the Monday was much more genial, and a correspondingly increased number of birds was seen. The estate of Mr. Lloyd-Greame at Sewerby was visited on the Saturday and Flamborough Head, whilst Boynton Wood was the Sunday venue. Although it was not the best time of the year, a surprisingly numerous list of birds was compiled by the observers.

In addition to the commoner Passeres the following birds were reported :—Rook, Jackdaw, Pigeon, Coot, Green Plover, nesting at Sewerby ; Mallard, Tufted Duck, Waterhen, Tawny Owl, Barn Owl, Kestrel ; Willow Warbler, Chiffchaff, Wheatear (3 pairs on the headland), Swallow, House Martin, Sand Martin, Great Tit, Blue Tit, Tree Pipit, Lesser Red Poll, Chaffinch, Corn Bunting, Stonechat, Yellow Bunting.

The sea birds included :—One Fulmar Petrel (Flamborough), Kittiwake, Razorbill (in small numbers), Shag, Cormorant, Puffin, Herring Gull, Lesser Blackback.

The only mammals reported were hares and rabbits.

This list is of considerable interest in many instances, in its relation to bird movements, as Flamborough is on a well recognised flight-line for the migrants. Mr. Major Lawson reported the occurrence during the past year of the badger at Danes' Dyke. Mr. Flintoff reported that a Little Grebe was killed on March 26th, apparently on migration, through contact with the lantern of the Flamborough Lighthouse. It is extraordinary how such an ill adapted bird for high or long-distance flying, should be capable of obeying what seems to be the universal law of migration. The greater and the Lesser Spotted Woodpeckers, the Green Woodpecker, the Tree Creeper, Kingfisher, Teal, Goldcrested Wren and Nightjar all nest in the district. Wood Warbler was noted last year, but has not been reported for this year, while the Bullfinch, Goldfinch and Sparrow Hawk occur but sparingly. I am also indebted to Mr. W. G. Bramley and Mr. A. E. Peck for much assistance in this report.

MOLLUSCA (Greevz Fysher).—A few littoral species were observed living on rocks on the beach towards Danes' Dyke. On other occasions, in a stream at Boynton, near the Gypsy Race, *Limnæa palustris*, *L. peregra* and *Physa fontinalis* were observed. Two terrestrial species, *H. rufescens* and *Hyalinia nitidula* were taken in a quarry adjoining. In a stream between Burton Agnes and Skipsea, *Paludestrina jenkinsi* was abundant, and with dredging the ubiquitous *Limnæa peregra*, as well as *Sphærium corneum* and *Valvata piscinalis* were taken.

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A Biology of the British Hemiptera-Heteroptera, by E. A. Butler. London: H. F. and G. Witherby, viii.+682 pp., £3 3s. od. net. A standard and up-to-date monograph on this difficult branch of insecta has long been a desideratum, and we know of no one more qualified than Mr. Butler to have carried out such a work. The author does not attempt to supplant Saunders' Hemiptera-Heteroptera of the British Isles, but rather substantiates it, and he refrains from including descriptions of the perfect insects excepting of such as have been added to the British list since the publication of Saunders' work. His aim has been rather to gather together all the scattered information about the early stages, life history, habits, and distribution of British species. His frequent use of the word 'unknown' gives an indication of many directions in which further work requires doing, and the author does his best to induce students to carry this out. In recent years the number of workers undertaking the study of the 'neglected orders' has substantially increased, but their work has been retarded by the lack of suitable and reliable text-books on the subject. For the future those interested in Hemiptera-Heteroptera will have no difficulty in the identification of their species, and the very elaborate table showing the distribution of the different forms in the various counties will form an admirable guide to those anxious to investigate the fauna of the neglected areas. Messrs. Witherby have done their work in their usual manner, and we should specially like to congratulate them on the excellence of the coloured plates.

YORKSHIRE BRYOLOGISTS AT AUSTWICK.

F. E. MILSOM.

THE Easter week-end spent at Austwick by the Bryological Section of the Yorkshire Naturalists' Union proved highly successful. A party of twenty-two assembled, and the weather, except on the Saturday, was all that could be desired. A more suitable centre than Austwick could hardly have been chosen, the country being composed of many variable types of scenery, and under the expert guidance of Messrs. Cheetham and Burrell, the chief points in the moss-flora of each type were well demonstrated. Each evening many of the party found their way to 'The Cottage' for the mutual examination and discussion of specimens.

On the Monday the party had the advantage of the presence of Mr. Wilson, of Sedburgh. His intimate knowledge, both of mosses and hepatics, was a great asset.

Sunday showing promise of lasting fine weather, it was decided to tackle Ingleboro'. The route taken was *via* Clapham Cave and Gaping Ghyll, whence straight to the top. One of the features was the fine show of *Saxifraga oppositifolium* on the north-west side.

A return was made over Simon Fell and Crummack Dale, although half the party only got a glimpse of the latter!

Saturday arrived with a wet morning, but the party set out *via* Norber for the top of Moughton, passing through the extensive juniper 'forest' on the latter. Lunch was taken on a ledge looking over Ribblesdale, after which a move was made in the direction of Arco Wood, and so home.

On Sunday two short excursions were arranged for those who cared to join, in the morning to Austwick Moss, and in the afternoon to Trow Gill, near Clapham Cave.

The Ingleton Ghylls were visited on Easter Monday, and in spite of slight disadvantages inherent in such a popular place on a Bank Holiday a most profitable day was spent.

The more interesting species gathered were as follow :—

MOSSES.

<i>Andreæa petrophila.</i>	<i>Trichostomum crispulum.</i>
<i>A. crassinervia.</i>	var. <i>nigroviride.</i>
<i>Oligotrichum hercynicum.</i>	<i>T. mutabile</i> var. <i>cophocarpum.</i>
<i>Diphyscium foliosum.</i>	<i>Ulota Bruchii.</i>
<i>Swartzia montana</i>	<i>Splachnum sphaericum.</i>
<i>Seligeria pusilla</i>	<i>Funaria calcarea.</i>
<i>S. recurvata</i>	<i>F. ericetorum</i>
<i>Rhabdoweisia fugax</i>	<i>Plagiobryum Zierii.</i>
<i>Campylopus atrovirens</i>	<i>Orthodontium gracile.</i>
<i>Grimmia trichophylla.</i>	<i>Bryum alpinum.</i>
<i>G. Doniana.</i>	<i>Mnium orthorrhyncum.</i>
<i>G. junalis.</i>	<i>Myurella julacea.</i>
<i>Racomitrium protensum.</i>	<i>Pseudoleskea catenulata</i>
<i>R. heterostichum.</i>	<i>Thuidium Philiberti.</i>
<i>Amblystegium confervoides</i>	<i>T. recognitum.</i>
<i>Pterogonium gracile</i>	<i>T. delicatulum.</i>
<i>Pleuroidium subulatum</i>	<i>Hypnum sarmentosum.</i>
<i>Breutelia arcuata.</i>	<i>H. giganteum.</i>
<i>Orthothecium intricatum</i>	<i>H. incurvatum.</i>
<i>Zygodon gracilis.</i>	

HEPATICES.

<i>Riccia sorocarpa.</i>	<i>Odontoschisma Sphagni.</i>
<i>R. Lescuriana.</i>	<i>Calypogeia Trichomanis.</i>
<i>Reboulia hemisphærica.</i>	var. <i>aquatica.</i>
<i>Marsupella emarginata.</i>	<i>Bazzania trilobata.</i>
<i>Aplozia cordifolia.</i>	<i>Scapania aspera.</i>
<i>Lophozia incisa.</i>	<i>Madotheca lævigata.</i>
<i>L. barbata.</i>	<i>Microlejeunea ulicina.</i>
<i>Leptoscypus Taylori.</i>	<i>Cololejeunea Rossettiana.</i>
* <i>Cephalozia macrostachya.</i>	<i>Frullania microphylla.</i>

* New record for Yorkshire. Fide W. E. Nicholson.

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A Naturalist in Hindustan, by R. W. G. Hingston. London: H. F. & G. Witherby. 292 pp., 16/- net. By the aid of this book Major Hingston makes the naturalist familiar with a district about which we have far too little information as regards the smaller members of the Fauna, larger animals of course being rather more frequently dealt with. In his fifteen chapters we have Descriptions of the Manjha; The Indian Black Ant; Evolution of Instinct; The Byre-Building Ants; several chapters on the various spiders and their habits, and Dung-Burying and Dung-Rolling Beetles; the concluding chapter being The South-West Monsoon and its effect on the Fauna. There are several suitable illustrations, some being very striking. We are glad to welcome the appearance of such a healthy volume dealing with an aspect of natural history so frequently neglected.

From the same firm has been issued a still more substantial work, **The Deer and Deer Forests of Scotland**, by A. I. McConnochie (336 pp., 25/- net), in which the author, by the aid of carved stones, tapestries, etc., is able to give an insight in deer-hunting even so early as the eleventh century. The next section of his work deals with the seventeenth century and after. We then have Lists of Forests, with some descriptive notes; Days in the Forests; The Deer; Poaching; and Superstitions. All through, however, it is patent that the writer is more than usually familiar with the subject upon which he discourses, and the remarkable views of Highland scenery quite give an atmosphere to the narrative. It is not necessary to be a naturalist, however, to read and enjoy every page of this work.

The Appearance of Mind, by J. C. McKerrow. London: Longmans, Green & Co., xv.+120 pp., 6/- net. The following extract from the author's Preface, possibly will give a better idea of this volume than any words of ours: 'My title is intended to imply that "Mind" is not a Reality. It may be thought that the book is a very small one in which to abolish Mind. But in fact there is no such attempt. What I have done is to set forth, in place of the Notion of Mind, that of another Immaterial Principle, which shall adequately perform its functions. And that is all I have done. There is no polemic against the Subjective interpretation of living-phenomena; nor attempt to persuade the reader in favour of my own. I have found a tendency, among those to whom I have opened my theory, to identify it with "Behaviourism." And indeed I use the word "tendency" a great deal. But I am no more a Behaviourist than Newton, who may be supposed to have held that the apple "tended towards the earth." Behaviourism, as I understand it, is not a theory, but a Method. I can readily believe, however, that my theory will be welcomed by Behaviourists more sympathetically than by the more orthodox Psychologists. They have cast out the subject from their system; their house is swept and garnished; and so far as I know has not yet received any new tenants.'

THE MITES OF YORKSHIRE.

WM. FALCONER, F.E.S.

(Continued from page 184).

The abbreviations employed in the body of the list in place of the names of the various naturalists, who have collected, or of the publications, which have recorded, Yorkshire mites are shown below ; the uninitialled entries are my own contribution.

R.S.B.=Mr. Bagnall.	S.L.M.=Mr. S. L. Mosley.
F.B.=Mr. Booth.	S.M.=Mr. Margerison.
H.B.B.=Mr. Booth.	P. & W.=Messrs. Pearce and
R.M.B.=Mr. Brown.	Warburton.
R.B.=Mr. Rosse Butterfield.	F.R.=Mr. Rhodes.
B.O.=Michael's British	C.D.S.=Mr. Soar.
Oribatidæ.	J.S.=Mr. James Smith
H.V.C.=Captain Corbett.	(Borrowby).
W.J.F.=Mr. Fordham.	T.S.=Mr. Stainforth.
J.E.H.=Rev. J. E. Hull.	R.A.T.=Rev. R. A. Taylor.
J.W.H.=Dr. Harrison.	W.E.L.W.=Mr. Wattam.
A.D.M.=Mr. Michael.	W.P.W.=Mr. Winter.
F.A.M.=Mr. Mason.	T.A.T.P.=Terrestrial Acari of
	the Tyne Province.

LIST.

CLASS—ARACHNIDA. ORDER—ACARINA.

I.—SUB-ORDER—VERMIFORMIA.

Fam. ERIOPHYIDÆ.
(Gall Mites.)

Eriophyes pteridis Moll.

V.C. 62.—Beast Cliff, Iburn Dale, and Jagger Howe Beck, near Wragby Wood, H. J. B. ; on bracken.

E. tenuis Nal.

V.C. 62.—Scalby, on *Dactylis glomerata*.

V.C. 63.—Wilberlee (Slaithwaite), on dog's tooth grass.

V.C. 64.—Askham Bog, on *Agrostis* spec.

E. psilaspis Nal.

V.C. 63.—Hey Wood (Honley), Woodsome and Fixby, S. L. M.—still there ; Armitage Bridge and Blackmoorfoot Reservoir grounds ; on yew.

E. tetanothrix Nal.

V.C. 62.—On *S. cinerea*, near Falcon Inn, Beast Cliff, Iburn Dale, Jagger Howe Dale, Staintondale Moor and Hardhurst Moor, H. J. B. ; on *S. repens*, Harwood Dale and near Mitten Hill, H. J. B.

V.C. 63.—On *S. aurita*, Barrett Clough and Drop Clough. On *S. cinerea*, Cat's Clough, Millshaw (Holmfirth), but not abundant.

V.C. 64.—On *S. aurita*, Adel Bog and lower down the stream. On *S. cinerea*, Askham Bog.

V.C. 65.—On *S. cinerea*, Aysgarth, two localities.

E. salicis Nal.

V.C. 62.—On *S. caprea*, Falcon Inn, Ravenscar, Hayburn Wyke and Raincliff Woods.

- V.C. 63.—On *S. caprea*, Hurst Wood, W. P. W.; widespread and plentiful around Huddersfield. On *S. cinerea*, Drop Clough. On *S. aurita*, Bottoms Wood (Slaithwaite), Drop Clough, and Honley Old Wood.
- V.C. 64.—On *S. caprea*, *cinerea* and *aurita*, Adel Moor. On *S. cinerea*, Askham Bog. On *S. caprea*, Scarcroft Hill and Dalton Lane.
- V.C. 65.—On *S. caprea*, Newbiggin (Bishopdale), W. P. W.; Aysgarth and Masham.
- Eriophyes* spec. Houard S. 53.
- V.C. 62.—On *S. fragilis* and *alba*, Cornelian Bay, H. J. B.; on *S. fragilis*, Scarborough Mere.
- V.C. 63.—On *S. fragilis*, Banks Wood (Emley), Coxley Valley, Cannon Hall Park.
- E.* spec.—Houard S. 56.
- V.C. 63.—On *S. aurita*, Barrett Clough and Bottoms Wood (Slaithwaite), Honley Old Wood. On *S. caprea*, Coxley Valley. On *S. cinerea*, Drop Clough.
- V.C. 64.—On *S. aurita*, Adel Moor.
- E.* spec.—Houard S. 59.
- V.C. 64.—On *S. alba*, edge of leaf attacked and deformed, Askham Bog.
- E. varius* Nal.
On aspen.
- V.C. 62.—North Yorkshire, R. S. B., J. W. H.
- V.C. 63.—Thunder Bridge, near Huddersfield.
- V.C. 64.—Nanny Bridge, in King Lane, Adel.
- E. lionotus* Nal.
This and the next three on birch.
- V.C. 62.—Hayburn Wyke, H. J. B.
- V.C. 63.—Honley Old Wood, near Stockgate quarry.
- V.C. 64.—Chandler's Whin.
- V.C. 65.—Cogden Gill, Swaledale.
- E. rudis* Can. ('big bud').
- V.C. 62.—Hayburn Wyke, H. J. B.
- V.C. 63.—Brockholes, S. L. M.; Bottoms Wood (Slaithwaite), Deanhead, Drop Clough (Marsden), Hall Heys Wood (Meltham), Honley Old Wood, Savile Wood, New Mill, Wooldale, Riding Wood (Holmfirth), Mollicar Woods, Lepton Great Wood.
- V.C. 64.—Roundhay Park (Leeds); King Wood and Adel Moor; Askham Bog.
- V.C. 65.—Wood near Healaugh, Swaledale.
- E. rudis* Can. var. *longiseta* Nal.
- V.C. 63.—Sun Dean, S. L. M.; Drop Clough.
- V.C. 65.—Aysgarth.
- E.* spec. Swanton, No. 199.
- V.C. 63.—Seen in several localities about Huddersfield. This form has not much basis at present and needs further investigation.
- E. brevitarsus* Fckn.
This and the next three on alder.
- V.C. 61.—Bempton.
- V.C. 62.—Ellerburn and Jagger Howe Dale, H. J. B.; Cayton Bay.
- V.C. 63.—Barrett Clough (Slaithwaite), Drop Clough, Boothroyd Wood, Thunder Bridge, Holme Bridge, Mollicar Woods; plentiful where it occurs.
- V.C. 64.—Glen Beck to Seven Arches, W. P. W.; Roundhay Park (Leeds), Adel Moor, Askham Bog.
- V.C. 65.—Newbiggin (Bishopdale), W. P. W.; Washburn Valley, F.R.; Wensleydale, from Hawes to Masham, abundant; Grinton and Richmond, Swaledale.

Eriophyes laevis Nal.

V.C. 62.—Lady Edith's Drive, Scarborough.

V.C. 63.—Ellen Springs, S. L. M., one specimen only.

V.C. 64.—Washburn Valley, Mr. Atkinson; Gorge, Roundhay Park, Adel Moor and Wothersome.

V.C. 65.—Newbiggin (Bishopdale), W. P. W.; Washburn Valley, F. R.; Wensleydale, from Hawes to Masham; Swaledale, plentiful.

E. nalepai Fckn.

V.C. 61.—Dane's Dyke.

V.C. 62.—Scarborough district, general and abundant.

V.C. 63.—Marley, Mr. Morrell; Huddersfield district, wherever alders occur.

V.C. 64.—Washburn Valley, Mr. Atkinson; Glen Beck to Seven Arches and Reva, W. P. W.; Roundhay Park (Leeds), Adel Moor, Wothersome, Askham Bog.

V.C. 65.—Newbiggin (Bishopdale), W. P. W.; Wensleydale, from Hawes to Masham, abundant; Swaledale.

E. spec. Houard, 1135.

V.C. 64.—Abnormal rows of brown hairs along the nervures, Adel Moor, Askham Bog.

E. avellanæ Nal. ('big bud.')

On hazel.

V.C. 62.—Fyling Hall, H. J. B.; Raincliff Woods.

V.C. 63.—Plentiful around Huddersfield.

V.C. 64.—Reva, W. P. W.; Roundhay Park (Leeds), Thorner and Dalton Lane.

V.C. 65.—Wensleydale and Swaledale, abundant.

E. quercinus Can.

On oak. Rows of abnormal hairs along the veins.

V.C. 63.—Barrett Clough (Slaithwaite).

V.C. 64.—King Wood Lane, Adel.

Eriophyes spec.

On beech, no previous record been found. Terminal internode of twig densely covered with hyaline and brown, long, tapering, and ascending abnormal hairs, which extend also to the petioles and lower midribs of the accompanying pair of leaves.

V.C. 63.—Spring Wood, Netherton, July, 1919.

E. atrichus Nal.

On *Stellaria graminea*.

V.C. 62.—Staintondale, H. J. B.

V.C. 63.—Whitley Woods, S. L. M.; Varley Road, Slaithwaite, Farnley Hey, Cannon Hall Park.

V.C. 64.—On *S. glauca*, Askham Bog.

E. ribis Nal.

On currants, oftenest on the black, probably widespread and plentiful.

V.C. 62.—Thornton Dale, F. A. M.; Cloughton.

V.C. 63.—Huddersfield district, common. On the white variety and gooseberry, Kirkheaton.

V.C. 65.—Askrigg, on gooseberry.

E. padi Nal.

V.C. 65.—On blackthorn, Aysgarth and many localities between Wensley and Coverham. On bird cherry, Semmerdale and Aysgarth, and in Swaledale.

E. similis Nal.

V.C. 62.—On blackthorn, Langdale End and places near the coast, H. J. B.; Scarborough, on coast just beyond the barracks.

V.C. 65.—Newbiggin (Bishopdale), W. P. W.; Wensley Dale, Aysgarth and many localities between Wensley, Coverham and Middleham, abundant.

Eriophyes paderineus Nal.

On bird cherry.

V.C. 63.—Barrett Clough, Slaithwaite.

? *E. spec. (rosae* Swanton).

V.C. 63.—Fenay Bridge, Lepton Great Wood, Cockatoo Wood (Honley), Mollicar Woods, on *Rosa arvensis*. Not yet established. The gall is apparently the same as that given by Houard as affecting a large number of bushes under the name of a dragon fly (*Lestes viridis* Van der Lind.), but within brackets as doubtful. I have not been able to discover any agent.

It, or one like it, occurs also on crab-apple at Fenay Bridge (the bush has since been cut down), and Mr. S. L. Mosley has noticed it on guelder rose at Hoyland.

E. gibbosus Nal.

On bramble.

V.C. 62.—Beast Cliff, on *R. plicatus* H. J. B.

V.C. 63.—In the old lane leading out of Honley Old Wood towards Wilshaw, in plenty.

E. spec.

V.C. 62.—Veins of the leaves of meadow sweet, thickened at base and elsewhere formed into hollow cylinders; on the cliff, Cornelian Bay, Scarborough, H. J. B.

E. pyri Pgnst. (includes *E. cratægi* Can.).

Mostly on mountain ash.

V.C. 62.—Hayburn Wyke, Black Beck, Langdale and Bloody Beck, H. J. B.

V.C. 63.—Sun Dean, Honley Old Wood and Gunthwaite (Huddersfield).

V.C. 64.—Adel Bog, Miss Pilkington.

V.C. 65.—Newbiggin (Bishopdale), W. P. W.; Aysgarth; wood between Downholme Bridge and Marrick Priory, Swaledale.

On hawthorn, V.C. 62, Scalby; and V.C. 64, Askham Bog.

E. goniothorax Nal.

On hawthorn—usually plentiful.

V.C. 61.—Dane's Dyke.

V.C. 62.—Scalla Moor, Hayburn Wyke, Beast Cliff, Fyling Hall, Cowgate Slack and Seamer Carr House, H. J. B.

V.C. 63.—Barrett Clough (Slaithwaite), Thunder Bridge and Carr Wood (Woodsome).

V.C. 64.—Adel Bog, Stubbing Moor and Askham Bog.

V.C. 65.—Newbiggin (Bishopdale), W. P. W.; Semmerdale, Aysgarth and Jervaulx; Healaugh, Gogden Gill, Marrick and Richmond.

E. spec.

On *erineum* on hawthorn leaves, apparently undescribed.

V.C. 64.—A rounded elevation on upper surface tinted reddish-brown, with a corresponding concavity below filled with a mass of short, stout irregularly bloated abnormal hairs, at first pale-coloured and passing through yellowish-brown to red, Chandler's Whin. First observed at Llangollen in 1919.

E. nudus Nal.

V.C. 62.—On wood avens between Nunthorpe and Ormesby, R. S. B., J. W. H.

E. euaspis Nal.

V.C. 62.—N. Yorkshire, but rare on *Lotus major*, R. S. B., J. W. H.; Robin Hood's Bay, on *L. corniculatus*, H. J. B.

V.C. 63.—Emley, on *L. major*.

(To be continued).

THE HOLDERNESS HARPOONS.

Since the notes in our magazine for May, the following have appeared in the *Yorkshire Post* :—

Sir,—In the course of discussion in the Press as to the genuineness of the bone implements known as the 'Holderness Harpoons,' several references have recently appeared to a committee of the British Association, as having pronounced upon the question. I am directed to ask you to give publicity to the fact that no committee was appointed by the Association or its Anthropological Section to investigate this subject.—Yours, etc., O. J. R. HOWARTH, *Secretary, British Association for the Advancement of Science.*

SIR,—The unfortunate references in the Press relative to the Cambridge Committee of investigation as a committee of the British Association, and to which the Secretary recently drew attention, are much to be regretted.

Research Committees of the British Association are appointed by the Council, on the recommendation of Sectional Committees. The discussion on the Holderness harpoons did not take place until the closing session of the Hull meeting, by which time the Committee of the Anthropology Section had ceased to function. Therefore, the appointment of a research committee was not possible. Being deemed too important to be allowed to rest until the Committee re-assembled at Liverpool in 1923, the matter was taken up by a number of its members, the outcome of which was the formation of the Cambridge Committee, consisting of two prominent members of the Anthropology Section Committee, with the addition of an eminent geologist, himself a member of the British Association. It was therefore unofficial, and not specifically appointed by the Council of the British Association, but this in no way detracts from the value of its findings, which are completely in favour of the authenticity and importance of the harpoons.—Yours, etc., A. LESLIE ARMSTRONG.

Sir,—In view of the suggestion made by Professor Kendall, that further discussion on this matter should be suspended until an examination could be made of some alleged documents, I have refrained from replying to Mr. Armstrong, but his communication in your impression of this morning calls for an immediate reply.

The 'unfortunate references' to the British Association Committee were Mr. Armstrong's, and began with a special article in *The Times* on April 17, when the findings of 'two committees' were stated to have proved the genuineness of the harpoons. Even the Editor of *The Times* at first refused to publish any reply, seeing that a British Association Committee had sat and pronounced upon this matter. It now appears that the three gentlemen from Cambridge were self-elected, and had no authority whatever for publishing a report under the auspices of the British Association, and seeing that at least one of these had previously published particulars of the harpoons as though they were genuine, there was naturally a prejudice on the matter, which should not exist in the case of a tribunal of this character. However, as we are now able to eliminate entirely the British Association Committee (or, as now termed, the Cambridge committee) from these findings, we are left with that appointed by the Royal Anthropological Institute; and from its Chairman, Sir Hercules Read, I have recently had a communication in which he states: 'The spearheads must be relegated to the Scottish verdict of "Not proven."'

As we have now come down to this, it would seem that the original references by Mr. Armstrong that two committees had proved that the harpoons were genuine, which were copied by most of the papers in the country, were indeed 'unfortunate.'

It is this loose way of expressing oneself which has certainly interfered

with a proper vision in connection with these harpoons. In a 'personal interview' with Mr. Armstrong it was stated that 'Every member of the British Association agreed with Mr. Armstrong but Mr. Sheppard.' The British Association is divided into thirteen sections, to one of which Mr. Armstrong's paper was given, and as only about four members expressed an opinion at all it is difficult to see how such a statement as that reported could have been made.

Similarly, we were told that no illustration anything like the harpoons had previously been published. An illustration of a very similar one to that found at Hornsea, which originally appeared in 1872, is reproduced in the current number of *The Naturalist*. In another communication recently Mr. Armstrong states that 'No illustration of the harpoon similar to the Skipsea one has ever been published in this country until the appearance of the current issue of *Man*.' Mr. Armstrong himself published an illustration of it in September, 1922.

With regard to the mysterious log-books, I am assured by the Secretary of the Royal Anthropological Institute, and by the members of the committee which sat in London, that they were not mentioned in any way when the committee met in London, and this opinion coincides with my own impression of that meeting.

Mr. E. Howarth's letter in *The Yorkshire Post* the other day is more cheerful. His suggestion that we should have a sense of humour, and read about certain antiquarian discoveries recorded by Dickens, seems to be paving the way for something, and, as Mr. Howarth tells us he has known the Morfitt family longer and probably better than most of us, it is to be hoped that he will eventually be able to give us a little more information about the harpoons than is at present available.—Yours, etc., T. SHEPPARD.

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The Little Guides : West Riding Yorks., by J. E. Morris. London : Methuen & Co., xx.+571 pp., 7/6 net. The fact that a second edition of this substantial work has been called for speaks well for its popularity. It has been thoroughly revised, many parts being re-written as a result of researches published since the first edition was issued in 1911, and there are many excellent plates, a good map, and an index. As we have said previously we look upon these little guides as the most useful and reliable on the market.

The Highlands with Rope and Rucksack, by E. A. Baker. London : H. F. & G. Witherby. 253 pp., 12/6 net. The author of this work seems to have devoted his attention recently to the Highlands, and gives an account of his achievements in Lorne, Lochaber, Cairngorms, Western Ross, Skye, and Arran. To those who delight in accounts of hair-breadth escapes, difficult climbs, etc., we cordially recommend this volume. There are some excellent illustrations and the printers and publishers have done their share remarkably well.

Below the Snow Line, by D. W. Freshfield. London : Constable & Co., viii.+270 pp., 18/- net. Any work from a former President of the Alpine Club dealing with climbing is bound to have sympathetic attention, but in the present case the articles are written with more than usual interest, and are evidently the experiences of an expert. Half a century ago the author wrote a book on The Italian Alps, and many of the articles appearing in the present collected volume originally saw daylight in *The Alpine Journal*. There are sketches, maps, etc., to illustrate the points brought forward, and his eleven chapters deal with The Maritime Alps ; Midsummer in Corsica ; Sketches from the Apennines ; Classical Climbs ; Through the Dinaric Alps ; The Kabyle Highlands ; Behind the Bernina ; The Bergamasque Alps and Lago d'Iseo ; By-corners in Savoy ; Byways in Japan ; The Mountains of the Moon.

FIELD NOTES.

Large Sturgeon at Scarborough.—On April 27th, 1923, a fine Sturgeon was captured near Whitby by the S.S. 'Esmeralda,' and landed at Scarborough. The fish measured 9 feet in length, weighed 16 stones, and was sold for £10 10s.—W. J. CLARKE, F.Z.S., Scarborough.

—: 0 :—

American Grey Squirrel in Yorkshire.—In the course of an enquiry into the present status and distribution of this alien species (*Sciurus carolinensis* or *Neosciurus carolinensis* Gmelin) in the British Isles, I have learned of its occurrence in three Yorkshire localities, viz. :—

(1) At Scampston Hall, Rillington, near York, Mr. W. H. St. Quintin received thirty or forty from Woburn, Bedfordshire, in June, 1906. For a year or two they did not appear to breed much ; then they began to increase rapidly, one nest being found with nine young in it. They became so destructive as to be a real nuisance, and it was necessary to reduce their numbers. This was done by shooting and trapping, and they were got down. A few are now tolerated, and when they become too numerous and complaints are made, the culprits are soon removed.

(2) In the West Riding near Bingley, Mr. H. B. Booth informs me that three or four pairs were liberated about ten years ago, and stray individuals used to be seen, but they appear to have died out or disappeared. One was seen at Ilkley in the winter of 1922, but this was probably an escape.

(3) Further north at Bedale, some pairs were turned out in 1913 or 1914, and increased, and in 1919 were said to be becoming numerous and to do a good deal of damage in gardens. (G. C., *The Field*, 22nd November, 1919).

I would express my indebtedness to Mr. St. Quintin and to Mr. Booth for kindly replying to my enquiries.

The places named are the furthest north records of the species in England, but in Scotland there is a strongly established and flourishing colony in Dumbartonshire.—HUGH BOYD WATT, 4th May, 1923.

With reference to the specimen recorded at Plumpton in the May *Naturalist*, I regret that the suggestion that it may have come from Copgrove is not correct. I had been informed by several residents that some of these animals had been turned out there, but Admiral Sir Francis Bridgeman has since told me that none has been turned down on the Copgrove estate. The probabilities, therefore, are that the Plumpton specimen may have come from Bedale, a distance of about twenty-two miles, as the crow flies.—R.F.

An Albino Field Mouse, *Apodemus sylvaticus* Linn., in Yorkshire.—Mr William Clayton has recently forwarded to me an albino variety of this interesting little mammal. It is perfectly white with pink eyes, and was obtained at Appleton Roebuck. The occurrence of this variety seems worthy of note seeing that few such specimens are recorded. In Barrett-Hamilton's 'History of British Mammals,' he remarks 'a good many completely or partially albinic individuals have been recorded,' but he only mentions two cases, the others being pale, buff, cream-coloured, etc. He further remarks that Laver had only seen one example out of a thousand specimens he had examined. Mr. Clayton has very kindly presented the specimen to the Yorkshire Museum.—WALTER E. COLLINGE.

—: o :—

***Viola calcarea* in Yorkshire.**—A violet which I gathered nearly two years ago, but which I have only recently had confirmed, has turned out to be a species new to Yorkshire. I gathered the plant on May 5th, 1921, in the woods adjoining Ledston Park. The extremely short spur and narrow petals suggested *Viola calcarea* Greg., and recently this has been confirmed by Miss I. M. Roper, F.L.S., of Bristol; also by Dr. G. Claridge Druce and Mrs. Gregory; the latter remarks that this is a rather more hairy form than the type. This is a new addition to the Yorkshire flora, the plant being frequent in the South of England, but not having been found further north than Dalton in Lancashire. If searched for, other stations may be found on the Permian Limestone tract.—W. ARTHUR SLEDGE.

—: o :—

***Testacella haliotidea* Cuv., and its Food.**—One day in mid-March, Mr. Alfred Schofield found four grubs of *Melolontha vulgaris* in his garden at Dalton, and knowing my desire for specimens of this grub, he hid these four in a pocket of earth pending a convenient time to convey them to me. When, a week or so later (having forgotten them in the meantime), he went for the grubs, he found, instead, two slugs which he brought, and which proved to be of this species. From this circumstance it seems safe to assume that the slugs had discovered the cockchafer grubs and devoured them. I believe the occurrence of *haliotidea* is itself a record, besides the additional point of interest regarding its food.—CHARLES MOSLEY, Huddersfield.

Vegetable and Animal Remains in Peat, near Hull.—During excavations made in connexion with the widening of the Beverley High Road, at Newland, Hull, last year, a thin bed of peat, resting on Boulder-clay, was excavated at a depth

of ten feet, the overlapping deposit being old Humber warp, or silt, accumulated when this part of the Hull valley was an arm of the Humber Estuary, the recent date of this deposit being indicated by the name to the hamlet, *Newland*. I submitted samples of the peat to Messrs. Chris. A. Cheetham and W. H. Burrell, of the Yorkshire Peat Investigation Committee, who report as under :—‘ Much silt visible, with woody debris and flattened stems of rush-like plants. A pocket of very sandy material on ignition lost 11% of its oven-dry weight ; an average peaty sample on ignition lost 66% of its oven-dry weight. Birch debris, fruits of *Carex*, and the flattened rush-like stems were the most abundant things recognised. In addition were *Sphagnum* leaves and pollen, traces ; Pine pollen, trace ; Fungus spores and hyphæ, plentiful ; Fern capsules, trace ; Polypody spores, numerous ; *Juncus communis* seeds, trace ; Birch and Hazel types of pollen, plentiful ; Water fleas, mites, chitinous jaws of larvæ, elytra and other fragments of Beetles, etc., Spermatophores. The vegetation suggests a fresh-water marsh with birch trees ; pine and hazel in the more or less remote distance. *Sphagnum cymbifolium*, the species present, is a plant of moderately wet places rather than the deeper marshes ; this and the birch would suggest “ at or above ” flood level at the time of growth.’—T. SHEPPARD.

—: o :—

A New Yorkshire Orthopteron.—I make the very belated record of the curious Orthopteron (*Pholidoptera griseo-aptera* De Geer = *Thamnotrizon cinereus*), taken by sweeping wayside vegetation near Beverley, in July, 1905. The species is not recorded in the Victoria County History, and is apparently rare in Yorkshire, for this single specimen is the only example I have ever met with in the county, although I have swept the species not uncommonly in Quy Fen, near Cambridge, and in sandy districts near Mildenhall, in Suffolk.—GEO. B. WALSH, B.Sc., Scarborough.

This is a most interesting addition to our list of Yorkshire orthoptera, and constitutes, up to now, the most northerly record for the species in Britain.—G. T. P.

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F. V. Theobald writes on ‘ Aphides on the Yellow Horned-Poppy,’ and G. B. Walsh on ‘ *Acrulina inflata* in N.E. England,’ in *The Entomologist’s Monthly Magazine* for May.

‘ The Winter Whiteness of the Stoat,’ ‘ A Century of Zoology at Edinburgh,’ ‘ Birds of Bute,’ and ‘ Insects of South Hebrides ’ are among the contents of *The Scottish Naturalist* for May.

In *British Birds* for May, N. Gilroy writes on ‘ The Nesting of Divers,’ Rev. F. C. R. Jourdain on ‘ The Specific Name of the Common Guillemot,’ and H. F. Witherby on a ‘ New British Form of the Common Guillemot.’

NORTHERN NEWS.

The editor of *Discovery* having 'noddled,' is 'grateful and regretful.' American Museum Novitates, No. 66, deals with Two Nocturnal Bees. Mr. W. Harrison Hutton, of Leeds, has been elected a Fellow of the Royal Microscopical Society.

A London bookseller offers the ornithological library formed by Major W. H. Mullens for sale for £3500.

We still receive reports of the damage done to bird life by oil discharge from ships, the latest complaint being from Sunderland.

Mr. T. Thorp, the Guildford Bookseller, has issued a catalogue containing 490 pages and about 12,000 entries, many of which are of interest to readers of this journal.

The Geological Society of London is appealing for £1,500 to enable it to cope with its accumulation of papers to be printed. We wonder whether the society ever obtains quotations for its printing!

The Palæobotanical collections of Dr. Dukinfield H. Scott, comprising 3000 microscope slides of British Carboniferous plants, have been secured by the Geological Department of the British Museum.

For the price of 2d., from H.M. Stationery Office can be obtained a Statistical Summary of output of production, proceeds and profits of the coal mining industry for the quarter ended 31st December, 1922.

The London County Council has issued a second edition of its Handbook, No. 7, entitled 'From Stone to Steel: a Handbook to the Cases Illustrating the Ages of Stone, Bronze and Iron.' It contains over 80 closely printed pages, is well illustrated, and is sold at the low price of sixpence.

Among the recently-elected Fellows of the Royal Society we notice the names of Dr. Barr, who was Professor of Engineering in the Yorkshire College, Leeds, from 1884-1889; Prof. C. H. Desch, Sheffield; Prof. E. Fawcett, Demonstrator in Anatomy, Leeds, from 1890 to 1893; Sir Douglas Mawson; and Prof. H. R. Procter, of the Leeds University.

The death is announced of Percival Ross, civil engineer, Bradford, at the age of sixty-five. He was a prominent member of the Bradford Antiquarian Society, and frequently contributed to its journal. He made a special study of the Roman roads of the West Riding and spent some time in excavating them. He was a member of the Yorkshire Naturalists' Union and several similar societies.

The British Museum (Natural History) has purchased the geological collection of the late Dr. Wheelton Hind, comprising about 7000 British Carboniferous fossils, formed by the collector in the course of about thirty years' researches on British Carboniferous stratigraphy. The collection contains about 1270 figured specimens, and about 500 type specimens, and includes a unique collection of mollusca from the coal measures of Staffordshire made by the late John Ward.

The annual meeting of the Darlington and Teesdale Naturalists' Field Club was held recently. Mr. John E. Nowers, the Hon. Secretary, in presenting his eighth annual report, said:—Eight Saturday excursions were arranged and carried out with an average attendance of 21.7. The evening meetings had an average attendance of 18.2. The largest attendance at any meeting was 44. Seven popular lectures were given in conjunction with the Mechanics' Institute, but only resulted in a very small profit. A number of specimens had been added to the Club's collection; books had been added to the library, and a new book-case purchased. Twenty-six new members had been elected to the Club. The present membership was 133. The report of the Treasurer (Mr. R. H. Sargent), showed a balance in hand of £30 os. 7d. The President (Mr. Hodson) characterised both reports as satisfactory. The report of the Librarian (Mr. Broadhead) stated that they had 301 books in the library. Mr. W. R. Wooler was elected President, and Mr. Richard Luck Vice-President. Mr. R. H. Sargent was re-elected Treasurer, and Mr. J. E. Nowers, secretary; with Miss Nowers as Assistant Secretary.

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PRINCIPALLY FOR THE NORTH OF ENGLAND. ☆

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RILEY FORTUNE, F.Z.S.

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NOTES AND COMMENTS.

A YORKSHIRE BOTANIST.

We learn from Vol. III. of the *Journal of the Arnold Arboretum*, in an article by C. S. Sargent, entitled 'The first fifty years of the Arnold Arboretum,' that: 'Jackson T. Dawson was the first superintendent of the Arboretum, and continued to fill this position and that of propagator until his death in the summer of 1916. Born in the East Riding of Yorkshire in 1841, Dawson was brought when a child to this country by his mother, and when eight years old was started in gardening in an uncle's nursery in Andover, Massachusetts. He served for three years in a Massachusetts regiment during the Civil War and was several times wounded. On his discharge from service in 1864, Dawson entered the employ of Hovey & Company, of Cambridge, at that time one of the important commercial nurseries of the United States. In 1871 he was made head gardener of the School of Horticulture at the Bussey Institution by Francis Parkman, the first professor of that department in the School, a position which he filled for three years, when he became superintendent of the Arboretum. Dawson had the real love for plants and an exceptional knowledge of them. As a plant propagator it is not possible that any one could have been his superior. No problem in propagation was ever too difficult for him to solve. At the Arboretum he was compelled to work in crowded quarters with insufficient appliances, and in spite of this handicap he raised for the Arboretum during his forty-two years of service probably more than a million plants, and there are now few public or private gardens in the northern hemisphere which have not been enriched by his labours. Dawson served the Arboretum faithfully and made many friends for it; and without his assistance it would have been impossible to make the collections of living plants what they are to-day.'

SCOTTISH FISHERIES.

From the Fisheries Board of Scotland we have received two valuable pamphlets which are well worth the consideration of naturalists interested in fishing. No. 1 gives 'Results of Salmon and Sea Trout Marking in Sea and River,' by W. L. Calderwood.* In this is recorded that 'one clean fish recaptured stands out as distinct from all similar records of our experience. It is the case of a clean fish marked in November in the Spey which has left that river, has travelled to the other side of the country, and been recaptured in the River Eden in Cumberland. I confess that when the information reached me I discredited it. The mark was sent and

* 20 pages, 1/6.

identified without any possible doubt, however, and after a good deal of correspondence I am compelled to accept the record although particulars of exact date are absent and we have no scales to compare with those taken at time of marking. The record is :

No.	lbs.	ins.		M.		
4830	15 $\frac{3}{4}$	34 $\frac{1}{2}$	clean	M.	24th Nov. 1921	Spey (Fochabers Railway Bridge).
	13 $\frac{1}{2}$	—	clean	—	Mid June 1922	Eden, at Warwick 'A spring fish, rather thin and coloured.'

DISTANCES SALMON TRAVEL.

'I have measured the distance from the Spey north round the Moray Firth, through the Pentland Firth, round Cape Wrath and down the west coast. The line was taken across the mouths of all west Highland locks, inside Skye, and outside Mull, through the Sound of Islay, and so to the Solway and Warwick, which is 8 miles up the Eden. I make the distance 630 miles.' Pamphlet No. 2 deals with 'Salmon Investigations in Scotland, 1921: Salmon of the River Spey,' by W. J. M. Menzies, contains 58 pages and is issued at 6s. This particular report is divided into ten chapters, viz: Material, Age Groups, Smolt Ages, Average Sizes, Condition, Calculated Lengths, Times of slow and rapid growth, Body Measurements, Scale Erosion, a Summary, and also a large number of elaborate tables well worth consideration.

PREHISTORIANS.

The Proceedings of the Prehistoric Society of East Anglia recently issued are again remarkable for their wealth of illustration, though many of the fragments and splinters of flint figured are not worth the expense which the illustrations have incurred. It hardly seems scientific to describe a celt as of 'non-flint stone.' Surely an expert on stone implements might have given a better description than that. Some of the papers printed seem to depend so much upon the imagination. A piece of flint having a mass of 'iron scoriæ' adhered to it, which may quite likely be one of the ordinary ferruginous masses so often found attached to flints, with which geologists are familiar, is described as '*probably* a relic of the early Iron Age,' without the slightest shred of evidence whatever. Some pebbles of quartz such as occur in almost any gravel deposit in the east of England 'may represent objects used in some primitive game.' A small hearth was 'probably used for burning the tines before breaking them off.' We rather fancy that the word 'possible' even would be a little too strong. Alleged scratches of alleged animals on flints are referred to as 'having horns, probably deer' etc. Deer have not horns.

' SOME ' SUMMARY.

One writer who exhibits drawings of animals on flints explains the results of his experiments, and fortunately puts his initials on a piece so that that one at any rate in the future will not be mistaken for an ancient engraving. The whole question of the date of Grimes' Graves, or as here described the 'Lower Grimes' Graves Culture,' is summarised as under :—' (1) If the implements, etc., are accepted as of late Palæolithic date, then the art of naturalistic engravings was practised at an earlier period than has hitherto been recognised. (2) If a Neolithic date is assigned, then we have here not only the recurrence of Palæolithic forms and technique, but also of Cave Art in Neolithic times.' We are glad to see that the author sees difficulties. It would be a kindness to present the Editor of the Proceedings of this Society with a blue pencil.

IN THE BEGINNING.

Dr. Frank Eve, of Hull, made a communication to the British Association at the Hull meeting which seemed to be of much more importance than the attention given to the subject seemed to show, possibly because of the difficulty of grasping the significance of his various arguments at so short a notice. His paper, however, is printed in *The Atlantic Monthly* for May, and the following introductory remarks will give an idea of his views on An Interpretation of Sunlight Energy :—' This account of my simple views on Life and its origins in terms of Energy will be intelligible to those who have the most rudimentary acquaintance with Chemistry and Physics. If they are also lovers of nature or gardens, and endowed with scientific curiosity, this essay will give them a fresh and simpler outlook on living things ; so that even such common objects as tree-buds and leaves, weeds and rust, clouds and rivers will acquire a new and fascinating interest and relationship.'

THE SUN'S LIGHT ENERGY.

' My own mind was set wondering about these things by noticing that, in a photograph of a landscape, the vegetation appears on the whole much darker than the background of rock or soil. This contrast is specially noticeable when the soil is of the tawny colour of a recent volcano, such as the Peak of Teneriffe. Oil of this color would probably predominate in our earth, when it had cooled sufficiently for Life to originate. This contrast shows that the light-energy of the sun has been absorbed and degraded to a greater extent than would have occurred if vegetation had never been invented. This raises certain questions :—Were plants evolved for the purpose ' of degrading the energy of sunshine?

Are plants the elaborately evolved manifestations or materializations of the law of degradation of energy? Has energy carved these elaborate organized channels to conduct its energy downhill, in the same way that the energy of water falling on a water-shed has carved the beds of the rivers? These are some of the questions we shall inquire into; and although they seemed to me wild and improbable at first, they do not seem so now.'

CORMORANTS.*

Mr. Massingham is well-known as a popular writer on natural history and topographical subjects, and his latest book is likely to be valued by nature lovers. The chapters, most of which have appeared previously in the magazines, include the late W. H. Hudson, Bearded Tit, Spoonbill, Richmond Park, Farne Islands, etc. Of the Cormorants, which are described as Gentleman Saurians, he says: 'I like them best, however, in statuesque repose. In Cornwall, I have seen as many as a hundred perched on a number of half-submerged rocks, in straight, military, equidistant rows, half of them with their wings fully extended and drying in the wind, like national eagles or heraldic figures. As they sat there in fakir-like meditation, or talked and bowed to one another with the gravity of senators, they might have been deliberating upon the immortality of the avian soul, or the problem of man's possession of demoniac powers, and kindred topics. To human beings interested in the debates they are equally disposed; from others they take instant flight and drop sheer from high places to gain a momentum, or take to the water, in which they swim with their bodies submerged and their long necks upreared and very serpentine.'

BRITISH MUSEUM GUIDES.

We should like to congratulate the British Museum (Natural History) upon the fact that it is able to produce its well-known handbooks at a price within easy reach of the public, and it is satisfactory to find that the authorities of these National Institutions are more concerned about getting their collections well known by means of cheap handbooks than they are in obtaining monetary profit from the sales. There has recently been issued the tenth edition of the 'Guide to the Fossil Mammals and Birds,' and the sixth edition of 'An Introduction to the Study of Rocks and Guide to the Mineral Collection.' The former is illustrated by nearly a hundred figures. We like the type and paper of the Introduction to the Study of Rocks better than the other, and it

* 'Untrodden Ways,' by H. J. Massingham. London: T. Fisher Unwin. 255 pp., 10/6 net.

would be an improvement if in future this could be lettered on the back as in the case of the Guide to the Fossil Mammals and Birds. The Handbooks are sold at the very reasonable price of 1/6 each.

BRITISH INSECTS AND HOW TO IDENTIFY THEM.*

It is difficult to understand why this book has been written, as certainly it is useless to anyone desirous of identifying British Insects, though by its aid the student may be able to distinguish a dragonfly from a wasp, or a fly from a beetle. The author is evidently not at home with his subject, and we presume his notes are really padding for the photographs which seem to be a little more in his line. The book ought to have another title.

BRITISH MUSEUM AND GEOLOGY.

For the price of one shilling the British Museum (Natural History) has issued an admirable Guide to the Exhibition Galleries of Geology and Palæontology (64 pp.), which is illustrated by plates containing photographs of William Smith and Gustavus Brander; a plan of the galleries, tables of strata, etc. In a chatty way Dr. Bather, the author, takes us round the various galleries in the Geological Department, and explains the principal exhibits. His Guide is thoroughly up to date, as we notice a reference is made to a Whitby Tradesman's token, dated 1667, which contains three Whitby 'snakestones,' representing the arms of Whitby, which we know has only very recently been added to the collection.

GUIDE TO THE MOLLUSCA.

A companion Guide to the Mollusca exhibited in the Zoological Department, British Museum (Natural History) (56 pp., 1/-), gives a general account of the structure, reproduction, habits, etc., of the Mollusca, and a summary of the principal divisions into which they have been put. The guide is illustrated by 47 admirable drawings and can be thoroughly recommended to the student. It has been prepared by Mr. G. C. Robson, and is based on the late E. A. Smith's contribution to the old Guide to the Shell and Starfish Galleries.

YORKSHIRE PHILOSOPHICAL SOCIETY.

The Annual Report of this Society has been issued, and besides the Meteorological Report, particulars of additions to the Museum and Library, it contains an account of the Centenary Celebrations which took place in September last, with copies of or extracts from the various congratulatory addresses which were submitted on that occasion. The Rev. Angelo Raine describes and figures two Roman Memorial

* By J. H. Crabtree. London: The Epworth Press, 64 pp., 1/6 net.

Stones recently discovered at York, which are so similar in workmanship as to suggest that they are the work of one man. The author considers each is the work of a local mason.

SCIENTIFIC MARES' NESTS.

A word of warning to those who make scientific discoveries. In the last few weeks (says a *Daily News* contributor), the following have been announced:—The skull of a million-year-old man, discovered by a German expert in Patagonia; a meteorite weighing five tons which fell in India during a thunderstorm; a new star in Cygnus; a new comet. The "skull" has been found to be a curiously-shaped piece of stone; the five-ton meteorite has turned out to be a mass of slag and bits of iron wire, caused by lightning striking an adjacent stack of straw. Careful search by astronomers has failed to locate the new star; and the American astronomer who announced the new comet has admitted he made a mistake.' This reminds us that an invitation to Mr. B. Morfitt, the 'discoverer' of the Holderness harpoons, given in *The Yorkshire Post* by a Lincolnshire solicitor, has not been accepted.

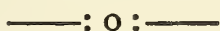
'INDEX ANIMALIUM.'

The poet has asked 'What's in a name?' To which we may reply, a great deal of dubiety and wrath, at least in the case of many scientific names whereof the old order is constantly changing, yielding place to new. In Zoology and Palæontology, the worker may often find himself bewildered at the changes which occur, and the man who is bitten by a mosquito, on being told that he must call it by a new name, would probably obey in quite a different sense from that intended, with the addition that a mosquito by any other name would bite as deep. If the above reflections appear to display a spirit of frivolity, we trust the censorious will regard it as the outcome of our general gratification at the issue of Part 2 of the second volume of Mr. Charles Sherborn's 'Index Animalium' (B.M. Publications, 20s. net.), a work which should be of great value to all who are vexed by the problems of Zoological nomenclature. It is now a long time since Mr. Sherborn commenced this colossal piece of work, and the volume before us must embody the results of an immense amount of labour. It includes all the specific names from 'aff' to 'anus' used between 1801 and 1850, the specific names being, of course, in each instance, followed by the various generic names to which it has been attached. For reasons which may easily be understood, the names are recorded without information as to the current titles of the animals referred to, but since the reference is given in every case one can consult the original articles. We must con-

gratulate the author on seeing still another portion of his monumental work through the press.

BOTANICAL SOCIETY AND EXCHANGE CLUB.

The Botanical Society and Exchange Club of the British Isles has issued its Report for 1922, prepared by the Secretary, Dr. G. Claridge Druce. It is a wonderful record of the botanical work accomplished by the Society during twelve months, and we believe it is largely due to the energy and enthusiasm of the editor that it is so complete. Among the special notes may be mentioned *Senecio squalidus* L., by W. A. Focke; *Serratula tinctoria* L., var. *campanulata* Rouy, *Crepis capillaris* (L.) Wallr., var. *glandulosa* Druce, *Satureia Calamintha* Scheele, var. *villosa* (Boiss.), *Alnus incana* Medik, *Orchis latifolia* L., and *Potamogeton coloratus* × *pusillus*, by the editor. There are Notices of Publications; New County and other Records; *Centaurea Scabiosa* L. by C. E. Britton; Some New English species of *Taraxacum*, by H. Dahlstedt; The Wanderings of the Groundsel, by J. Small, and a regrettably lengthy list of obituaries of well-known Botanists.



The Natural History of Selborne, by **Gilbert White**. London: John Lane, xl.+552 pp., 6/- net. It is not necessary to recommend White's book to readers of this journal, nor to describe the nature of the publication. With regard to the present edition for the money it is by far the best that has been published. It is admirably illustrated.

Maps and Survey, by **A. R. Hinks**. London: Cambridge University Press, xvi.+258 pp., 12/6 net. The popularity of this work is evidenced from the fact that already a second edition has been called for. It contains reproductions in colour of various forms of maps, with practical information which will be of inestimable value to travellers, and we think every teacher of geography should thoroughly master this volume.

John Penrose: A Romance of the Sea, by **J. C. Tregarthen**. London: John Murray, 342 pp., 7/6 net. This interesting story is evidently written by someone more than usually familiar with the Fauna and Flora of the Land's End district, its scenery, farm life, dialect, smuggling, etc. The author is able vividly to portray the character of the people on the farms. It is a narrative of love and rivalry, with the inevitable happy ending.

Botany of the Living Plant, by **F. O. Bower**. London: Macmillan & Co., xii.+634 pp., 25/-. In our impression for October, 1919, we gave a lengthy notice of this admirable volume, and, as we then anticipated, the time has come when a second edition has been called for. In the present issue the author has taken advantage of the suggestions made to him by various reviewers of his first edition, and he has added a new chapter entitled 'Evolution, Homoplasy, Homology, and Analogy.'

Guide to Shap and Haweswater, by **S. W. Partington**. London: John Heywood, 31 pp., 1/6. This is a series of notes, usually each about half-a-page in length, dealing with 'distances from Shap,' Keld Chapel, Knitting Sheaths and Sticks, The Countess's Pillar, Beacons, etc. There are numerous illustrations, and a paragraph headed 'Botanical Notes,' is principally interesting from the number of misprints in the twelve names of plants which presumably are supposed to represent the flora of the district.

THE SPITTAL AT FILEY BRIG.

WITH further reference to the notes appearing in this Journal for August last, pp. 257-262, Mr. F. Gerald Simpson, Hon. F.S.A.(Scot.), informs us that he took soundings in June last at three points, 'approximately (1) 100 yards, (2) 150 yards, and (3) 200 yards from the south side of the Brig.

'The Spittal was entirely submerged to a depth of about 4 feet at the time I took the soundings, but the line of it could easily be traced by the floating seaweed.



Photo by]

[F. G. Simpson.

'At (1) the *west* (or landward) face showed an abrupt fall of about 5 feet in 1 foot to 1 foot 6 inches; at (2) the fall was from 5 feet to 6 feet; at (3) the fall was from 8 feet to 9 feet in 1 foot 6 inches to 2 feet.

'The general cross-section appears to be something like the following sketch.

'There is no *abrupt fall to seaward*, but a slope thus :—



The photograph reproduced herewith was taken on April 3rd, when the tide was lower than usual and it shows the position of the Spittal much better than did the photograph appearing in the notes already referred to.—T.S.

***CALAMITES (CALAMITINA) GÖPPERTI* ETT.
AT HEBDEN BRIDGE, YORKS.**

J. WILFRID JACKSON, M.SC., F.G.S.
(*Assistant Keeper of the Manchester Museum*).

SOME months ago, while on a visit to Hebden Bridge with Messrs. W. B. Wright and W. Lloyd, both of H.M. Geological Survey, I had the good fortune to discover an interesting *Calamites* in the shales below the Kinder Scout Grit of that



***CALAMITES GÖPPERTI* ETT.**
($\frac{1}{2}$ nat. size),
found near Hebden Bridge, Yorks.

locality. The preservation of the specimen is remarkably good and this has rendered its identification a much easier matter than is usual in fossil plants from the Millstone Grit Series.

The locality where the specimen was found is in the Hebden Valley, 1 mile north of Lordholme Mill, about Walshaw Wood, on the right bank of the River Hebden. This portion of the valley is usually known as High Greenwood, whence came several of the species of fossil mollusca described by J. Phillips* and Captain Thomas Brown.†

The *Calamites* occurred in sandy micaceous mudstones, exposed beneath the Kinder Scout Grit escarpment, and was associated with a marine band containing *Pterinopecten papyraceus* Sow., *Posidoniella* (= *Gervillia*) *minor* T. Brown, *Glyphioceras* cf. *striolatum* J. Phil. (young example), and *Dimorphoceras* sp.

On seeing the specimen *in situ*, I was struck by its resemblance to *Calamites göpperti* Ett., and this identification has been confirmed by Dr. R. Kidston on a recent visit to the Manchester Museum. The occurrence of this species at such a low horizon is of great interest.

The specimen consists of the cast of a short length of decorticated stem crushed flat. The dimensions are : length, 187 mm. ; breadth, 35 mm. Only one whorl of branch scars is present, hence the length of the period of non-branch bearing internodes is unknown, as is the number of internodes in each period. The rest of the stem is divided into five internodes above the one bearing branch scars, and nine internodes below that level.

The branch scars are four in number : two oval, 13 mm. long ; one round, 10 mm. ; and one oval, 13 mm. long (separated from the last by a slight interval). In addition, there are very small, single, circular scars at the base of the third lower internode and at the base of the fifth internode. The length of the branch-bearing internode is 17 mm.

Calamites göpperti,
Ett.,
found near Hebden
Bridge.

The internodes are broader than long (see diagram) with impressions of fine longitudinal striations and irregular clefts, this surface being the cast of the exterior of the woody cylinder. A small portion of carbonaceous matter, representing the cortical tissue, is attached to the internode

* 'Geology of Yorkshire, Pt. 2, The Mountain Limestone District,' 1836 (especially pp. 234-5, Pl. XIX., figs. 14-19 and 26-32, *Gomiatites striolatus* and *G. reticulatus*).

† Trans. Manch. Geol. Soc., Vol. I. (1841), pp. 212-229, Pl. 7.

immediately below the whorl of branch scars. Leaf-scars are visible at all the nodes, but their shape is not clear. They are apparently subquadrate in outline.

According to Dr. R. Kidston and Dr. W. J. Jongmans,* *Calamites göpperti* Ett., is a well-known species of the Westphalian Series in Great Britain, Netherlands, Belgium, France, Germany and Bohemia. It is also recorded from the Stephanian of France. It is not given, however, for the Lanarkian Series in their monograph; but Dr. Kidston refers to a specimen in his First Report on the Carboniferous Flora of Yorkshire,† as follows:—‘*Calamitina (Calamites) göpperti* Ett., Lower Coal Measures. Hor.—Elland Flagstones. Loc.—Northowram, near Halifax (Halifax L. and P. Soc.).’ The Elland Flagstones are regarded as the top of the Lower Coal Measures. The Hebden Bridge discovery, therefore, extends the downward range of the species very materially, and furnishes clear proof of the Upper Carboniferous age of the shales below the Kinder Scout Grit of the neighbourhood. These shales have been variously known as Yoredale, or Pendleside, Shales. They are the Upper Yoredale Shales of Davis and Lees.‡ The true Yoredale Series of the Wensleydale area is acknowledged to be the local equivalent of the upper part of the Carboniferous Limestone elsewhere, and must be entirely dissociated from the beds with which we are dealing. These latter are much younger.

The specimen of *Calamites göpperti* dealt with in these notes has been deposited in the Manchester Museum (Registered No. L11772.).

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Prehistoric Ireland : A Manual of Irish Pre-Christian Archaeology, by **Rev. P. Power**. Dublin : Mellifont Press, Ltd., vii. + 96 pp., 2/- net. Most of the matter in this book originally appeared in a religious magazine, but it is written in simple language under the heads of The Stone, Bronze and Early Iron Ages, and Ancient Irish Religion. The author's object is to popularise the study of Irish antiquities. The proofs have been read by the late E. C. R. Armstrong, which means that the articles can be thoroughly relied upon.

Great and Small Things, by **Sir Ray Lankester**. London : Methuen & Co., xi. + 246 pp., 7/6 net. Messrs. Methuen continue to reprint the popular articles from the daily and weekly papers which Sir Ray Lankester's fertile pen produces, and in the present volume Sir Ray deals with an extraordinary variety of subjects, in twenty-seven chapters, as will be seen from the following selected titles : The Gorilla of Sloane Street ; Science and the Film ; The Pond-snail's Flea ; Is Nature Cruel ? An Eye at the back of the Head ; Wasps ; Spider-sense and Cat-sense ; The Last of the Alchemists ; Longevity ; Giants ; Various kinds of Monsters ; and Tobacco.

* Kidston and Jongmans 'A Monograph of the *Calamites* of Western Europe,' 1917.

† Trans. Yorks. Nat. Union, XIV., 1890, p. 16.

‡ 'West Yorkshire,' 1878, p. 95.

HOARD OF BRONZE AXES FROM EAST YORKSHIRE.

T. SHEPPARD, M.Sc., F.G.S.

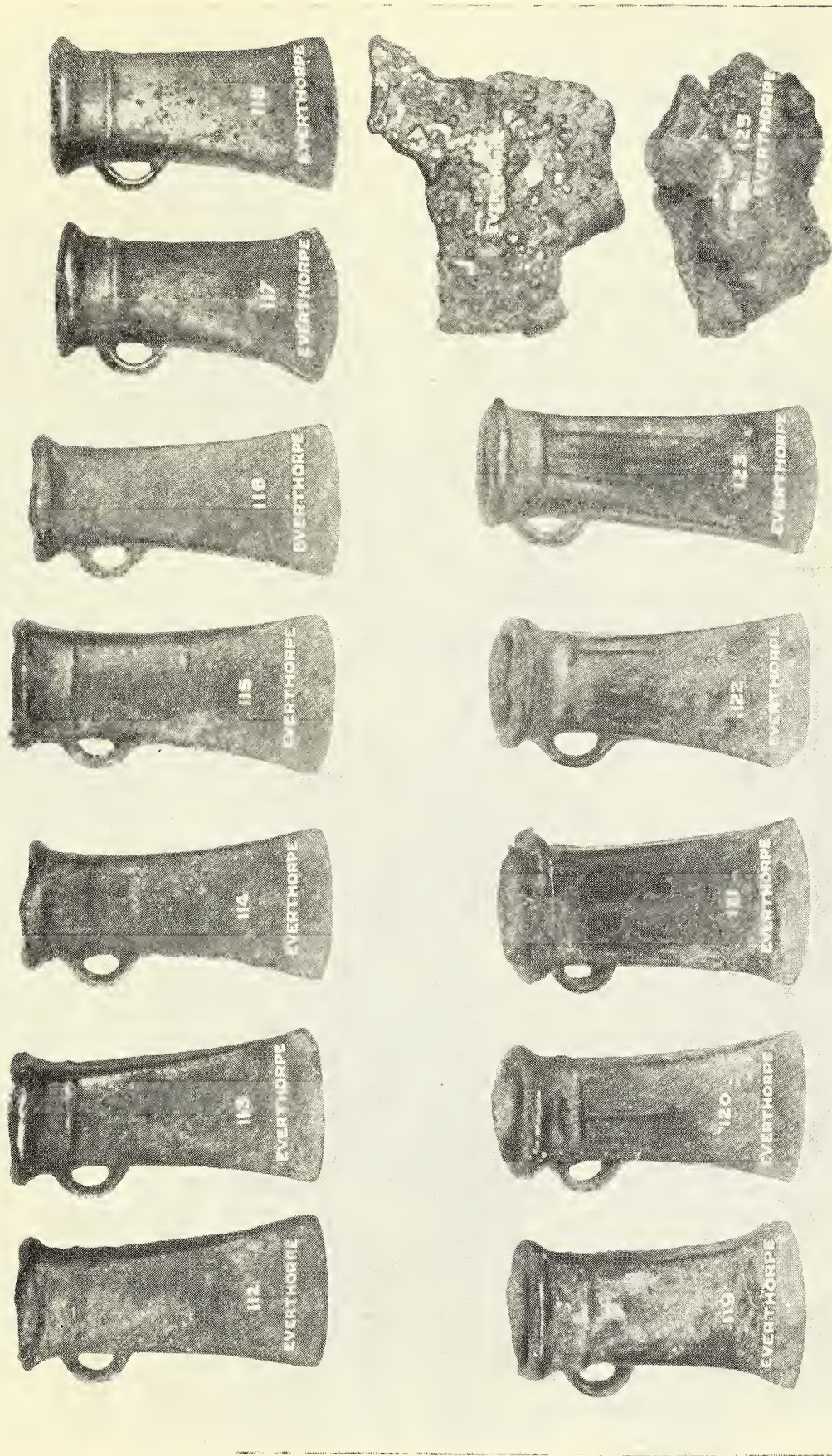
(PLATE III.).

MANY years ago, when compiling a list of the various relics of the Bronze Age found in East Yorkshire, I obtained a brief reference to the fact that in 1842 a hoard of sixteen Bronze Axes was obtained at Everthorpe, but careful search in the usual channels failed to obtain any trace of them, and the British Museum, Greenwell, Mortimer and other collections contained nothing from that place.

Quite recently, Colonel J. B. Stracey Clitherow, on whose property the axes were found, discovered the collection in a box in a cupboard, where it had been put away and forgotten, probably ever since the date of the find. This box contained twelve socketed axes and two large lumps of bronze, evidently from a crucible, and from a note written on the top of the box it was apparent that originally there were sixteen axes, one each having been given to Rev. Stillingfleet, Mr. Machell, Mr. Dannatt and 'J.C.C.'

Colonel Stracey Clitherow has frequently favoured the Hull Museums with interesting objects of this character, and has deposited these specimens with what is now a considerable collection of local Bronze-Age antiquities, including a number of hoards.

With regard to the Everthorpe collection, it is interesting from the fact that the specimens are mostly in an unfinished condition, though each one seems to have been well sharpened after being turned out of the mould. The axes are unusually wedge-shape in character, apparently due to the extent to which the sides have been ground down in the sharpening process. They all have a general resemblance, and while no two are exactly alike, each one is roughly square at the socket and has a single collar at a distance of about half-an-inch from the top. Eight of them show no trace whatever of the usual three lines joining the collar, whereas the other four show these lines or ridges, usually extending about half-way down the blade; in one instance (No. 121) they are particularly wide apart; they are closer together in No. 120, still closer in No. 122, while in 123 they are unusually close. There are slight holes, or flaws in casting, on Nos. 115, 122, and 123, and No. 121 is slightly cracked. As will be seen from the photograph there is a general similarity in size and shape, No. 121 being more square and massive than the average, No. 123 longer and more slender than usual.



Bronze-Age Hoard from Everthorpe.

No. 115 can be taken as an average example, and it measures $3\frac{3}{4}$ ins. in length, $1\frac{1}{2}$ ins. each way across the socket, and has a cutting edge very nearly 2 ins. in length. In most cases the ridges formed by the junction of the moulds are not very prominent. In two axes (Nos. 117 and 118), they have been deliberately filed away, while on No. 113 the ridge is particularly sharp; and so on.

The weights of the axes are as follows:—

No. 112	...	...	...	$7\frac{1}{2}$ ozs.
113	...	...	...	$7\frac{1}{2}$ „
114	...	...	...	$7\frac{1}{2}$ „
115	...	...	...	$8\frac{1}{2}$ „
116	...	...	...	8 „
117	...	...	...	7 „
118	...	...	...	$6\frac{1}{2}$ „
119	...	...	...	7 „
120	...	...	...	7 „
121	...	...	...	8 „
122	...	...	...	$8\frac{1}{2}$ „
123	...	...	...	$8\frac{1}{2}$ „

With regard to the two pieces of bronze from the crucible: as will be seen from the photograph, these are irregular in shape and have a semi-crystalline structure. The larger piece, which measures $3\frac{3}{4}$ ins. by $2\frac{1}{4}$ ins. by 1 in., weighs 21 ozs.; the smaller piece, which, however, is $1\frac{1}{4}$ ins. in thickness, weighs 17 ozs.

The site upon which the axes were found is now the gravel pit at the side of the old Hull and Barnsley Line, where the high road bridge crosses it in Everthorpe. This was pointed out to me by Colonel Stracey Clitherow.

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The Presidential Address of Lord Rothschild on 'Some Aspects of Variation in Lepidoptera' is printed in *The Transactions of the Entomological Society of London*, issued on May 5th.

The Selborne Society has issued No. 1 of *The Film Library*, including a List of Cinelogues and Informative Films available for Societies, Clubs, Institutes, Schools, Colleges and other Educational bodies.

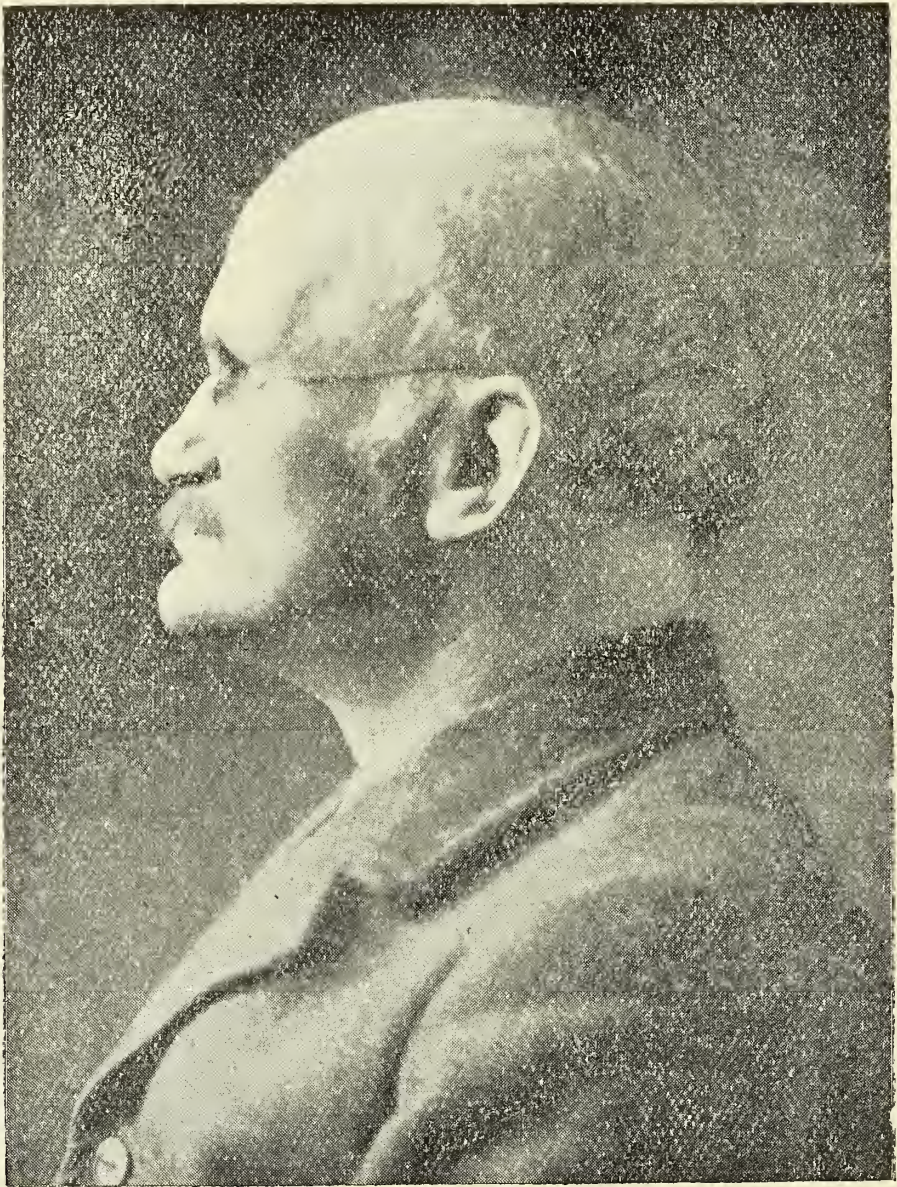
From the Annual Report of the Brighton and Hove Natural History and Philosophical Society, we learn 'In one milligramme of radium (a milligramme being one thirty-thousandth of an ounce) there were 100 [and 18 more o's after that] atoms.' We doubt it. In the same journal, Mr. H. S. Toms considers that the Butterfish (*Tapes decussatus*) was eaten by the Romans. We doubt that, too.

The Hull News states 'Make a point of not letting any month go by without hearing the robin and the wren sing, because these two birds can be heard throughout the year. The skylark has inspired more poets, perhaps, than any other British bird. It may be seen amid tufts of grass, ling, or heath, and towards the end of the breeding season its notes are frequently uttered from the ground.' This seems all right, but the paragraph is headed 'The Smallest British Sea-bird.'

In Memoriam.

WILLIAM INGHAM, B.A., 1854-1923.

ANOTHER of the older generation of bryologists is lost to Yorkshire by the death of William Ingham on May 28th last ; only one member of the 1905 Bryological Committee remains, and it is to a younger generation the Union must look for work and results such as were attained by those now passed away.



W. Ingham was born in Manchester in 1854, and after taking his degree at London University, he came to join the staff of the York Training College, which he left later to become the Organizing Inspector of Church Schools in York Diocese. In 1908 he joined the staff of the York Education Office and remained there until his retirement in 1922.

His earliest note in *The Naturalist* was in Nov., 1895, on *Malaxis paludosa* in Upper Teesdale, soon afterwards he

Naturalist

writes on *Hypnum giganteum* at Skipwith, the first of a long series of notes and articles on mosses and hepatics which he supplied until 1919. He gave a resume of the known Sphagna and Harpidioid Hypna of Yorkshire and Durham in 1901 and 1902, and a series of papers on the mosses and hepatics of districts where he had specially worked :—Skipwith, Strensall, Tadcaster, Arkengarthdale, Baugh Fell and Buckden.

From 1900 to 1914 the moss reports of the Union's meetings were generally supplied by him and the Annual reports of the section from 1908 to 1919.

He added about a score of mosses and hepatics to the county list, some of the latter being additions to the British Flora. In addition he recorded a large number of varieties of Sphagna and Harpidioid Hypna, the details of these variations specially appealing to his keenness for small differences which earned him (from Mr. J. F. Robinson) the title of 'our lynx-eyed bryological friend,' when he added *Sagina Reuteri* to the British plant list (1907).

Ingham was closely connected with the Moss Exchange Club which he joined in 1897 and his retirement practically coincided with its reconstruction as the British Bryological Society. The Annual Reports show that he contributed regularly and generously to the Exchange, and was a referee from 1899 onwards, specializing in Hypna. On the retirement of the Rev. C. H. Waddell in 1903, he became Hon. Secretary, and in that capacity became widely known among British Bryologists, especially in connexion with the publication of the Census Catalogues of British Mosses and Hepatics which he edited, and which are the most important works undertaken by the Club. His breakdown in health was indicated in the 1922 Report by his retirement from the Secretaryship and appointment as Hon. Member.

He also published occasional articles in the *Revue Bryologique* and *Journal of Botany*.—C.A.C.

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Among the contents of the *Proceedings of the Geologists' Association*, issued on April 27th, we notice 'Certain Jurassic Strata of Southern Northamptonshire,' by L. Richardson, and 'Trends in Carboniferous Corals,' by W. D. Long.

The *British Mycological Society* issues its *Transactions* promptly, and Part 4 of Vol. VIII. has recently appeared. It contains 'Recent Work on Lichens,' by A. L. Smith; 'Parasites of Scale-Insect Fungi, and the genus *Cladosterigma* Pat.', by T. Petch; 'Some additional records of Surrey Resupinate Hymenomycetes,' by E. M. Wakfield and A. A. Pearson; 'The production of Fruit-bodies of *Coprinus comatus* in Laboratory Cultures,' by Irene Mounce; 'Notes on some British Pyrenomycetes,' by Sir H. C. Hawley; 'Bark Canker Disease of Apple Trees caused by *Myxosporium corticolum* Edgert,' by G. G. Gilchrist; 'A New Species of *Sigmoideomyces* Thaxter,' by R. C. McLean; 'Wart Disease of the Potato,' by M. C. Potter; 'Records of *Fungi Imperfecti*,' by J. S. Bayliss Elliott and Olive P. Stansfield, etc.

In Memoriam.

FREDERIC WILLIAM HARMER, M.A., F.G.S.,
F.R.Met.Soc., etc.

SCIENCE has lost an earnest worker by the demise of this



Mr. Harmer with a large bone recently found in the Forest Bed.
Mundesley, near Cromer.

well-known geologist and meteorologist, after a short illness, on the 11th April last, in his eighty-eighth year.

Strenuous in business and civic life as Alderman, Mayor, Magistrate, etc., he was equally so in his private pursuits.

A botanist and geologist from early days, Mr. Harmer

speedily made acquaintance with the many eminent scientific men then known to Norwich. These included the Fitches, Woodward, Gurneys, John Gunn, James Reeve and a host of others.

An accidental meeting with S. V. Wood, junr., on the beach at Mundesley, in 1864, determined Mr. Harmer's scientific career, as he soon joined him in the mapping of the glacial deposits of East Anglia and the Midlands; Mr. Harmer taking Norfolk and Suffolk for his share of the work; Yorkshire and the North Riding having been dealt with by Mr. Wood and the Rev. J. L. Rome, of Hull.

The result of their joint labours was the production of a map that still holds the field, and is generally accepted, if not always acknowledged. So thorough was their work that Mr. Harmer told the writer that there was not a pit section nor opening of any kind they had not seen and investigated.

After Wood's death in 1884, Harmer retired from active geological work for some years, merely gathering materials and statistics for future use in a work on Glacial Phenomena which he was considering.

Mr. Harmer's latest views on the Glacial Geology of Norfolk and Suffolk appeared in 1910, and deals largely with the area and limits of the North Sea, or Scandinavian drift, and that of the Great Eastern Glacier, the moulder of the Kimmeridgian and Chalky boulder clays.

The status of the Pliocene deposits of the Anglo-Belgian basin next engaged his attention, and a series of papers was published in the *Q.J.G.Soc.* (Vols. 52, 54, 56). In these the constituents and areas of the different members of the Pliocene group in Holland, Belgium and England were exhaustively reviewed, a summary of the whole forming the Introduction to the second volume of his great work, 'The Pliocene Mollusca of Great Britain.'

For this purpose Mr. Harmer travelled extensively on the continent, from Sweden to Sicily, gathering as he went specimens and information. His correspondence was far wider, extending to Washington and Japan to Iceland, South Italy and France.

About 1910 or 1911, more than thirty years having passed since the last supplement to the Crag Mollusca was given to the geological world and new storehouses of material made known, Mr. Harmer began upon his *magnum opus*, 'The Pliocene Mollusca of Great Britain,' issued by the Palæontographical Society in two volumes (univalves only), with 65 crowded plates, and about 1000 pages of description. The last sheets went to press a few weeks before he died.

The excavations conducted at Little Oakley by himself strikingly illustrate his energy and determination in research.

Opened in a pasture meadow, the trench had to be filled in as the work progressed, and to get at the fossils more than 200 cubic yards of crag debris were washed in a $\frac{1}{4}$ -in. sieve, nearly 700 species of different organisms being the reward.

Mr. Harmer wrote much, and on many subjects, ranging from Hardy Ferns, the Marine Mollusca of Norfolk, or a local flint implement, to the Influence of the Winds upon Climate, and the 'Origin of Certain Canyon-like Valleys.'

Shortly before his death, Mr. Harmer had begun to arrange some notes that he had long been preparing in illustration of a Map of Glacial Contours, and the distribution of erratics in Eastern and Midland England.

Prof. Kendall, F.G.S., of Leeds, has kindly undertaken to deal with the manuscript, and to prepare the whole for the 'Proceedings of the Yorkshire Geological and Polytechnic Society.'

Mr. Harmer was a member of many Societies—Horticultural, Meteorological, Archæological, Prehistoric, Natural History and Geological in England, Belgium and France.—A. BELL.

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FIELD NOTES.

Thanaos tages near Hull.—I find *Thanaos tages* (the Dinky Skipper) regularly each year not more than two miles from Hull. This is recorded as extinct in the Hull district in the *British Association Handbook for Hull and District*. In the same locality, *Euchelia jacobææ* is common.—W. E. WHITE (17), 42 Dover Street, Hull.

The Imitative Starling.—It has been our custom to hang up pieces of fat for the tits, which come to the garden in large numbers. A fresh piece was suspended from a tree a few days ago. The same day we noticed a starling attempting to peck at it as it flew past, but with little success. Next day one, or perhaps two, were able to cling to the fat, and with considerable flapping of wings, peck bits off, apparently to their satisfaction, for they were very persistent. After another day, however, they were almost proficient in their imitation of the behaviour of the tits, they held on to string and fat in all sorts of positions, even upside-down, without now requiring the help of their wings, and in fact, could almost vie with the tits themselves in their ability to perform gymnastic feats while pecking. By the end of the week the young ones were brought to the tree and fed, the parent birds being quite adepts by this time in obtaining fat in tit-like fashion. Other starlings have tried to imitate these but so far without much success, and it seems as if two only have succeeded. It is the first time we have observed this behaviour of the starling, though we have been attracting the tits in this way to the same garden for more than ten years, and starlings have come to the garden every year.—J. M. BROWN.

MAMMALS.

Otters in Leeds.—At Meanwoodside, on the farm occupied by Mr. Holmes, is a drain issuing from a stone wall bounding a small stream, alongside which is a very much frequented public foot way. In this drain—two old otters and three young, apparently about three-quarters grown—had established themselves, and quite a good sized crowd collected to await their emergence which occurred on several evenings at dusk, notwithstanding conversation. A few feathers near the hole suggests that fish was not the only diet. They were detected at the end of April, and it does not seem to be known if the young were born there or not.—JASPER ATKINSON.

Walrus's Jaw Door-knocker at Louth.—When the old premises in Eastgate were being demolished, to be replaced

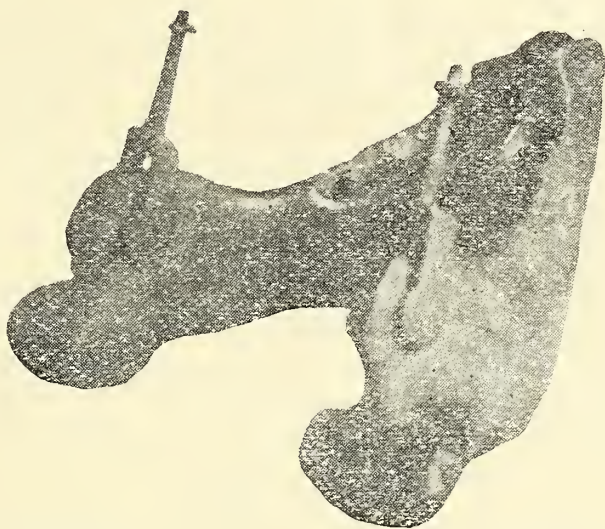


Photo by]

[R. C. McLay.

**Lower Jaw of Walrus (*Trichechus rosmarus*) Door-knocker,
Eastgate, Louth.**

by Messrs. Barclay's new Bank, I remembered that on the backdoor was a curious old knocker, which had been described to me as a tiger's jaw. It had evidently been there for a few generations, and was well coated with tar. Through the kindness of the architect, Mr. Harold Hall, it was eventually handed to me, for our local museum, when to my surprise it was not a tiger's jaw, but a heavily mineralized jaw of quite a different type of animal. At the striking point an oval iron stud has been driven in, and a pair of iron hinges at the points. The Borough Surveyor kindly made a sketch of it, which I sent to Mr. C. Davies Sherborn. He identified it as the lower jaw of a walrus, *Trichechus rosmarus*, and suggests that it probably came from the Dogger Bank. I am indebted to Mr. R. C. McLay for the photograph.—C. S. CARTER, Louth.

Several skulls and jaws of the walrus were brought to this

country by the old whalers, as 'trophies,' and, like the whales' jaws used as gate posts, bears' feet; seal 'flippers,' etc., are quite frequently met with in Yorkshire and Lincolnshire villages.—T. S.

American Grey Squirrels in Yorkshire.—With reference to the specimen lately killed at Plumpton, I fancy it may have come from this place (Ribston Hall). In the autumn of 1916 a single one appeared in the gardens here (probably a traveller from Scampston). Since then two others have occasionally been seen, one of which used to come to a bird table in the winter of 1921, and had lost one fore-leg in a trap. They show no signs of increase and seldom expose themselves. The red squirrel which used to be very plentiful became practically extinct about 10 years ago.—JOHN W. DENT.

Major Dent's experience with regard to the disappearance of the red squirrel from his estate, before the coming of the grey, is universal in the district. It is usual to blame the grey squirrel for the extermination of our native animal, but one cannot get away from the fact that he has been gradually becoming extinct for years, and in localities to which the grey squirrel has not penetrated, therefore the latter cannot in any way be responsible. The Plumpton specimen was obtained only a mile or so away from Ribston Park, so that Major Dent's surmise is no doubt correct. The writer was not aware that any had wandered into that locality,—R.F.

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FOSSILS.

Conulopsis abbreviatus in the Drift near Louth.—Several flint casts of small pyramidal-form Echinoderms, identified by Mr. Hawkins as *Conulopsis abbreviatus*, have been found in the neighbourhood associated with the boulder-clay gravel. Recently a postman brought me one he found at Great Carlton. This is the largest I have seen; it measures 36 mm. diameter at the base and 28 mm. in altitude.—C. S. CARTER, Louth.

Marsupite-zone type of Echinocorys in Drift at Louth.—Occasionally we meet with flint casts of Chalk Echinoderms, presumably from the Boulder Clay, and belonging to zones of chalk which are not otherwise represented in Lincolnshire. Recently I had brought to me a flint cast of an *Echinocorys scutatus*, found in a garden, on boulder clay, in Westgate, Louth. Mr. Sherborn expresses the opinion that it is a definite marsupite-zone type. When the new bowling green was being made a few years ago, in the same neighbourhood, a similar example, though rather larger at the base, was found six feet below the surface.—C. S. CARTER, Louth.

Holaster lævis (de Luc), etc., from Lincolnshire Red Chalk.—I was present last autumn when the base of the Red Chalk was being excavated wherein to build new kilns, in the Old Lime pit, Donington-on-Bain. The complete vertical section of the Red Chalk here is 8 ft. 4 in. From about 12 in. to 18 in. above the Carstone, one of the workmen threw out to me two nodules. On being cleaned one proved to be an imperfect Nautilus and the other a fairly respectable Echinoderm. In order to be certain, I sent it to Mr. C. Davies Sherborn, who kindly identified it as *Holaster lævis* de Luc. As far as I can learn, this species has not been previously recorded for the Red Chalk of Lincolnshire.—C. S. CARTER, Louth.

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ENTOMOLOGY.

Thecla rubi L. in Derbyshire. In *The Naturalist*, 1919, p. 11, Dr. Eric and H. Drabble record *Thecla rubi* L. (Green Hairstreak) taken near Chesterfield, by Mr. S. Hooke, as a new record for North-east Derbyshire. I can now add a second county-locality for this butterfly, having disturbed a specimen while grubbing among heather and bilberry at Grindleford on May 24th last.—J. M. BROWN, Sheffield, 30th May, 1923.

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FUNGI.

Daldinia concentrica in West Yorkshire.—A peculiar and distinctive Pyrenomycetous fungus was brought to me a little time ago by the finder—Miss Edith Hatfield. This has been kindly identified by Mr. H. J. Wheldon as *Daldinia concentrica* Bolt. It was apparently saprophytic on dead ash trunks, at an elevation of about 300 feet, and was seen in some amount by the path between Rose Hill and Upper Haugh, about three miles to the north of Rotherham. This is an additional station to those recorded in *The Fungus Flora of Yorkshire*.—A. A. DALLMAN, Higher Tranmere, Birkenhead.

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The Report of the Castle Museum of Norwich for 1922 contains an illustration of the exterior of the Strangers' Hall, Norwich, recently given to the city by Mr. L. G. Bolingbroke. There are numerous 'lists of additions.'

We learn from Bulletin No. XLI. of the South Eastern Union of Scientific Societies that 'at noon the members will assemble to sign the roll, a very important function.' We regret to learn that Mr. H. Norman Gray is resigning the secretaryship of the Union.

The First Annual Report of the Worthing Archaeological Society has been issued, and although the Society was only formed last year, it now has a membership of 229. The Curator of the Museums at Hull attended the Inaugural Meeting, and gave an address on 'Three thousand years of Hidden Treasure,' and is the Society's only Honorary Life Member.

YORKSHIRE NATURALISTS AT HELMSLEY.

W. H. PEARSALL, D.SC., F.L.S., AND F. A. MASON, F.R.M.S.

ABOUT forty members attended the 306th meeting of the Yorkshire Naturalists' Union at Helmsley, May 19th to 21st. The weather was moderately kind. On Saturday the party went to Rievaulx, visited the abbey under the guidance of Mr. H. E. Wroot, and examined the improvements being effected by H.M. Office of Works. The return journey was made down Beckdale. On Sunday, most of the time was spent on Ryedale and Duncombe Park, while the majority of the members devoted Whit-Monday to Riccal Dale. The Park proved to be a veritable sanctuary for bird-life, and the 'bird-men' had little need to wander much further afield. The Castle was besieged and bombarded (with cameras) in due form, and a bat hunt is understood to have taken place within its walls.

The general meeting was held on Monday evening, Mr. H. B. Booth being in the chair. The proceedings opened with a vote of condolence to Dr. T. W. Woodhead, and to the relatives of the late Mr. J. W. Sutcliffe (Halifax). After the sectional reports, votes of thanks to the Trustees of the Duncombe Park Estate, and to Captain Hay, for their kindness in throwing open the estate to the Union, were passed. The thanks of the meeting were also accorded to Messrs. A. I. Burnley, A. Gordon, and H. Slater, to whose arrangements or guidance the success of the meeting was largely due. Two new members were elected.

GEOLOGY (H. C. Versey) :—An examination was made of the Jurassic rocks from the horizon of the Cornbrash to that of the Kimeridge Clay in the three parallel valleys of the Rye, Riccal and Hutton Beck. The last-named is rightly described as one of the best natural sections in the district. The Cornbrash was only seen in one locality, *i.e.*, north of Hutton village, where a bed of argillaceous limestone yielded the typical fossils. What appears to be a new record for the country is a plant found in the Oxford Clay at Hutton by Mr. W. P. Winter. This has been sent to Mr. Hamshaw Thomas for identification. The local nature of many of the facies of the Kelloways Rock was emphasised on the excursion because in the three sections visited a considerable lithological variation was noticed from a sandstone indistinguishable from Estuarine Series (Rye Valley) to a fine grained sandstone full of dwarfed fossils (Hutton).

The large fault which flanks the Tabular Hills on the south was well exposed in the Riccal valley and on Hutton Beck, and in each case the river which sank into the ground along the outcrop of the Upper Limestone and Coral Rag began to reappear along the fault line.

ECOLOGY (W. H. Pearsall) :—The vegetation of the Helmsley district closely resembles that of Thornton Dale in type. The underlying rocks are more or less calcareous, either limestones or grits, and the uplands are deeply dissected by the larger streams. The valley sides are for the most part steep (about 1 in 5), and their unstable surfaces present a diverse series of plant habitats and plant communities. The native woodlands belong to the Ash-Oak series, but the variation in their tree composition is locally very extreme (from pure Oak to Ash-Elm) the ground flora shewing a parallel complexity. There is, however, a certain uniformity of arrangement among these different types of vegetation, and this may be attributed to the physiographic changes observable on the valley slopes. The rock surface is usually exposed and weathered to calcareous debris at the top of the slopes, but the soil formed is gradually washed down to the lower parts. Below the rock waste there is a zone where the soil has partly or largely lost its lime and is becoming markedly 'sour.' At the bottom of the slopes there is a third zone of deeper soil, constantly receiving lime washings from above. As a general rule, therefore, the calcareous types of vegetation occur at the top and bottom

of a slope, the more heathy types of vegetation in the central zone. On the south side of Ryedale, for example, the ground vegetation from above downward is (1) *Mercurialis-Hypnum molluscum*, (2) Bilberry, or *Dicranum majus* and *Mnium hornum*, (3) *Brachypodium sylvaticum* on unstable soils, where the river is cutting away the base of the slope. On the east side of Riccal Dale, the series is (1) *Mercurialis-Fragaria vesca*, (2) *Pteridium-Scabiosa succisa*, (3) *Mercurialis-Allium ursinum*—*Anemone nemorosa*. Zone two here may frequently be *Dicranum majus* and *Mnium hornum*, and further up the valley, where it turns west, these two mosses, with *Leucobryum* and *Blechnum spicant* are quite dominant, on thin leached soil, although the limestone waste below is frequently visible. The wood in the latter place is almost pure Oak (*Q. sessilis*) and where it has been cut there is birch scrub (*B. pubescens* and *B. alba*) with a little oak and mountain ash. The ground flora here shews root layering well. The mosses mentioned above are less common, but are attached to the surface humus, while Bracken (dominant) ling and *Deschampsia flexuosa* root in the leached soil below, and *Convallaria majalis* and some *Mercurialis* are rooted in the limestone waste about six inches below the surface. The slope here faces south, and shews a very decided contrast to the opposite slope, otherwise similar in rocks and gradient. The north facing slope is covered with a mixed Oak wood containing about 25% ash, and a prominent shrub layer. *Mercurialis* is much more abundant (dominant where the wood is cut), and there is great abundance of ferns, particularly *Blechnum*, *Dryopteris dilatata* and *D. Filix-mas* on leached soil in the *Dicranum-Mnium* community, *Polystichum aculeatum*, *D. Phegopteris* and *D. polypodiodes* on the rock waste. Where this wood has been cut, there is a scrub of some 60% *Betula alba* and 40% Ash.

The following summary shews the average percentage composition of the trees in the more widely spread types of ground flora :—

Ground flora type	Ash	Elm	Oak	pH	Most abundant seedlings.
<i>Mercurialis</i>	60	14	21	6.7-7.0	Ash.
<i>Brachypodium sylv.</i>	28	24	40		Ash.
<i>Pteridium</i>	20	4	70	5.0-6.3	Ash and <i>P. aucuparia</i> .
<i>Dicranum-Mnium</i>	3	—	87	5.0-5.5	<i>Pyrus aucuparia</i> .
<i>Vaccinium Myrtillus</i>	—	—	98	4.6	<i>Pyrus aucuparia</i>

Holly appears to be the constant associate of the purer oak-woods, while *Acer campestre* is very characteristic of the Ash-Elm woods. Few, if any, oak seedlings were seen, though Ash and Mountain Ash seedlings were common in all stages of development. Ash becomes very abundant on cutting mixed woods, but the sites of pure oakwood appeared to be colonised by birch or holly.

An interesting feature of Riccal Dale was the number of large ant's nests with dense masses of *Mercurialis* growing on them. The material of these nests was very slightly acid (pH. 6.8).

BRYOLOGY (W. H. Burrell) :—Several interesting plants were seen, of which the following are noted for the sake of establishing their general distribution in the county :—

Ryedale near Rievaulx: *Fissidens viridulus*, *Tortula marginata*, *Amblystegium fluviatile*.

Hawnby: *Seligeria recurvata*, *Homalia trichomanoides*, *Pterygophyllum lucens*, *Orthothecium intricatum*, *Aplozia pumila*, *Nowellia curvifolia*.

Western Slopes of Hambleton Hills above Sutton: *Polytrichum gracile*, *Seligeria recurvata* (in great profusion on Sandstone blocks), *Fissidens pusillus*, *Brachythecium rutabulum* with galled leaves, *Sphenolobus exsectiformis*, *Blepharostoma trichophyllum*, *Scapania umbrosa*.

MYCOLOGY (F. A. Mason) :—As the result of three forays held at Helmsley by the Yorkshire Mycological Committee (*The Naturalist*, 1903, p. 425; 1919, p. 396; and 1920, p. 397), no fewer than 632 species of fungi had been recorded for the district previous to the present visit

of the Union. All the forays have been held in autumn, and this occasion presented an opportunity for comparing the spring flora with that observed at the later period of the year, as well as for extending our knowledge of the distribution of the species relative to other natural features as discussed in Dr. Pearsall's notes. A conspicuous discrepancy, of course, is seen in the scarcity of humicolous fungi, represented largely by agarics which constitute the greater proportion of the species found in the autumn lists. On the other hand, fungi belonging to all the other groups are in abundance at this time of the year, and there is ample evidence that much remains to be learned regarding the occurrence of the uredines, ascomycetes, and the *fungi imperfecti*. The Mycological Committee was represented by Messrs. A. E. Peck, Greevz Fysher and Fowler Jones; Mr. W. P. Winter and Misses Hewlett, McIlroy and Wray did good work in collecting parasitic fungi and other minute species.

Beck Dale: A striking feature of *Helleborus viridis* was its susceptibility to parasitic attack by *Urocystis anemones*; about three-quarters of the plants examined were more or less badly disfigured by this fungus, the leaves being swollen and otherwise distorted.

The marshy ground bordering the stream yielded practically all the fungi noted on this excursion. A number of wind-sown ash saplings of some four or five years' growth on the edge of this marsh were seen to be suffering from some form of 'die-back' disease; all the dead parts bore the same fungus, which proved to be *Diplodia inquinans*. The following species were noted in this dale:—

<i>Uromyces Valerianæ</i> Fckl.	<i>Triphragmium Ulmarie</i> Link.
<i>U. Geranii</i> Ott. et Wart.	* <i>Melampsora Rostrupii</i> Wagner.
* <i>U. Alchemillæ</i> Lév.	<i>M. Euphorbii</i> Curt.
* <i>U. Ficariæ</i> Lév.	<i>Sphaerotheca pannosa</i> Wallr.
<i>U. Dactylidis</i> Ott.	* <i>Erysiphe graminis</i> D.C.
* <i>U. Poæ</i> Rabenh.	<i>E. Polygoni</i> D.C.
<i>Puccinia Centaureæ</i> D.C.	* <i>Nectria cinnabarina</i> Fr.
<i>P. Leontodontis</i> Jacky.	* <i>N. ditissima</i> Ful.
<i>P. Chondrillæ</i> Corda.	<i>Hypocrea rufa</i> Fr.
* <i>P. Hieracii</i> Mart.	* <i>Rhopographus filicinus</i> Nke.
<i>P. Primulæ</i> Duby.	<i>Phyllachora graminis</i> Nke.
* <i>P. Saniculæ</i> Grev.	<i>Endodothella junci</i> Theiss. et Syd.
* <i>P. tumida</i> Grev.	<i>Mycosphaerella Fragariæ</i> Tul.
<i>P. Angelicæ</i> Fckl.	* <i>Leptosphaeria acuta</i> Ces. et de Not.
<i>P. pulverulenta</i> Grev.	* <i>Trochila Illicis</i> Fr.
* <i>P. Violæ</i> D.C.	<i>Mollisia cinerea</i> (Batsch) Karst.
<i>P. fusca</i> Wint.	<i>M. benesuada</i> (Tul.) Phill.
* <i>P. Caricis</i> Reb.	<i>Ombrophila clavis</i> (Alb. et Schw.).
* <i>Phragmidium mucronatum</i>	* <i>Hyaloscypha hyalina</i> (Pers.) Boud.
Schlecht.	<i>Phoma complanata</i> Fr.

Riccal Dale: Those species marked with an asterisk in the foregoing list also occurred here. *Puccinia fusca* on *Anemone nemorosa* was exceptionally abundant. Its effect on the plant, in addition to bleaching the leaf, is to elongate the petiole, and the plants attacked could be detected over a large area from some distance by noting this difference. An uncommon species, *Pseudopeziza repanda* Sacc., occurred on *Sherardia arvensis*, and it has not previously been reported on this host in Yorkshire. The following additional species were seen:—

<i>Sphaerobolus stellatus</i>	<i>Coprinus micaceus</i>
<i>Tricholoma gambosum</i>	<i>C. plicatilis</i> .
<i>Tolanea pascua</i> .	<i>Polyporus brumalis</i> .
<i>Galera tenera</i> .	<i>Hymenochaete rubiginosa</i> .
<i>Tubaria furfuracea</i> .	<i>Exidia glandulosa</i> .

<i>Dacryomyces deliquescens.</i>	<i>Aleuria vesiculosa</i> (Bull.) Boud.
<i>Uromyces flectens</i> Lagerh.	<i>Sclerotinia tuberosa</i> (Hedw.) Fckl.
<i>U. Rumicis</i> Wint.	<i>Ciliaria scutellata</i> (Linn.) Quel.
<i>Puccinia obtegens</i> Tul.	<i>Helotium herbarum</i> (Pers.) Fr.
<i>P. Betonicæ</i> D.C.	<i>Trichoscypha</i> (<i>Dasyscypha</i>) <i>Caly-</i>
<i>P. Winteriana</i> Magn.	<i>cina</i> (Schum.) Boud.
<i>P. Baryi</i> Wint.	<i>Coccomyces coronatus</i> (Schum.)
<i>Hypoxylon fuscum</i> (Pers.) Bull.	de Not.
<i>H. coccineum</i> Bull.	<i>Phoma samararum</i> Desm.
<i>Xylaria polymorpha</i> Pers.	<i>Phomopsis pterophila</i> Died.
<i>X. hypoxylon</i> Linn.	<i>Trichoderma lignorum</i> Pers.
<i>Daldinia concentrica</i> (Bolt.) de Not.	

Duncombe Park : This extensive area may be considered as consisting of (i.) ornamental gardens and shrubbery ; (ii.) pastures ; and (iii.) woodlands, with much old timber. The latter, so far as examined, are ash-oak and beech respectively. The following are the more interesting species collected within these sub-divisions of the park (see also list of additions to the county flora, *infra*).

- (i.) *Cystopus candidus* Lév., on cultivated *Arabis*.
Peronospora pygmæa Schroet., on *Anemone*.
Peronospora Schleideni Unger, on *Allium ursinum*.
Puccinia Pringsheimiana Kleb., on *Ribes alpinum*.
Urocystis Anemones Schroet., on *Anemone* and *Ranunculus*.
U. Violæ Fisch., on *V. canina*.
Phacidium multivalve (D.C.) Kunze and Schm., on *Ilex*.
Trochila craterium (D.C.) Fr., on *Hedera*.
T. buxi Capron. *Fumago vagans* Pers., on *Laurus nobilis*.
Coccomyces coronatus, (Schum.) de Not., on oak leaves.
- (ii.) *Tricholoma gambosum* forming large fairy rings.
Marasmius dryophilus. *Morchella vulgaris* (Pers.) Boud.
M. oreades *Acetabula vulgaris* Fckl.
Entyloma sericeum. *Cheilymenia coprinaria* (Cke.) Boud.
Psathyra corrugis. *Ascobolus stercorarius* (Bull.) Schroet.
Coprinus micaceus.
- (iii.) a. Ash-Oak woods.
Polyporus squamosus. *Tremella mesenterica*.
P. hirsutus. *Exidia glandulosa*.
P. brumalis. *Melanconis stilbostoma* (Fr.) Tul.
P. sulphureus. *Eutypa spinosa* Tul.
P. frondosus. *Diaporthe revellens* Nke.
- b. Beechwoods :
Fomes fomentarius. *Phlebia merismoides*.
Russula ochroleuca. *Irpex obliquus*.
Stereum purpureum. *Coniophora puteana*.

Species new to Yorkshire :—

- Valsa* (*Eutypella*) *Sorbi* (Alb. et Schw.) Fr., on dead branches of *Pyrus aucuparia*, Duncombe Park.
Diaporthe revellens Nke., on dead branches of *Corylus avellana*, Duncombe Park.
Hypoxylon semi-immersum Nke., on decaying, decorticated wood, coloured green, probably by *Chlorosplenium aeruginosum*, Beechwoods, Duncombe Park.
Leptosphaeria dolioloides (Auersw.) Ces. et de Not., on dead stems of *Lapsana communis*, Beckdale.
L. Rusci (Wallr.) Ces. et de Not., on cladodes and twigs of *Ruscus aculeatus*, in the shrubbery, Duncombe Park.
Microthyrium litigiosum Sacc., on dry rachis of *Pteridium aquilinum*, Duncombe Park.
Phyllosticta Ruscicola Dur. et Mont., on cladodes of *R. aculeatus*, shrubbery, Duncombe Park.

Phomopsis stictica Trav., on dead twigs of *Buxus sempervirens*, shrubbery, Duncombe Park.

Diplodia inquinans Westend., on twigs of *Fraxinus excelsior*, Beckdale.

Hendersonia Henriquesiana S. & R., on last year's fruits of *Rosa canina*, Beckdale.

Thyriostroma Pteridis Died., on dry rachis of *Pteridium aquilinum*, Duncombe Park.

T. Spiraeae Died., on dead stems of *S. Ulmaria*, Beckdale.

Sporonema strobilinum Desm., on cones of *Picea* sp., Riccal Dale.

Botrytis Paeoniæ Oudem., on the lower leaves and petioles of cultivated Paeony, ornamental gardens, Duncombe Park.

My acknowledgments for help in the identification and confirmation of the species in this list are due to Sir H. C. Hawley and Mr. W. B. Grove, M.A., The first three species are *certe* H.C.H., and the remainder, with the exception of the last, *certe* W.B.G. I am also indebted to Mr. A. Clarke for searching the county records before admitting these additions.

LICHENS (W. E. L. Wattam) :—Helmsley and its immediate vicinity is undoubtedly rich in this class of plants, judged from the areas traversed, though time did not permit of systematic search. The rich woodlands and valleys, with converging moorland and high escarpments would add considerably to the list of species appended. The areas traversed were the right-hand portion of Duncombe Park to Rievaulx, Beckdale, and Riccal Valley as far as Hasty Bank, and the upper part of Ryedale to Hawnby, returning by way of Ristbrow, Murton, Mount Pleasant and Old Byland.

Calicium hyperellum Ach. Aged oaks, Duncombe Park.

Lempholemma confertum Nyl., on calcareous debris (road through Duncombe Park).

Collema pulposum Ach., amongst calcareous debris, gateway to Helmsley Castle, on calcareous grit rocks stream in valley between Murton and Old Byland, and among calcareous debris of the water flushes to left of road top end of Rievaulx village.

C. furvum (Ach), amongst debris, wet and mossy rocks, Duncombe Park; also among debris of calcareous grit exposures, Hawnby Road.

Leptogium scotinum F., on calcareous grit stones of the water flushes, top end of Rievaulx village, and also near head of Riccal Valley.

Ramalina farinacea Ach., on Scots pine and spruce, Duncombe Park.

Evernia furfuracea Fr., common on aged oak, ash, mountain elm, Duncombe Park, and Old Byland, and in the woods from Rievaulx to Hawnby.

Peltigera canina Hoffm., among mosses and dead grass, woods, Duncombe Park; Beckdale; Riccal Valley; also brought by Mr. W. P. Winter from Hutton Ghyll, near Kirkbymoorside.

P. spuria Leight., among mosses, upper part of Riccal Valley.

Pannaria rubiginosa Del., in Dub. calcareous grit walls, Helmsley, Hawnby, Rievaulx.

Parmelia perlata Ach. Calcareous grit walls Helmsley and Hawnby; aged oaks, Duncombe Park.

P. saxatilis Ach. Common on oak, ash, mountain elm, hawthorn and calcareous grit walls. Form *furfuracea* Fr., on aged oak, ash and mountain elm.

P. conspersa. Aged oaks, Duncombe Park; corallian exposures, Rievaulx and Hawnby.

P. fuliginosa Nyl. Aged oaks and ash, Duncombe Park, Rievaulx and Hawnby; calcareous grit walls, Hawnby. Var. *latevirens* Nyl. Aged oaks and palings, Duncombe Park.

P. physodes Ach. Common on trees, oak, ash, mountain elm, Scots pine and spruce. Calcareous grit and corallian stones, Duncombe

- Park, Riccal Valley, Beckdale, Rievaulx, Hawnby and Old Byland.
Form *labrosa* on aged oak, ash and Scots pine.
- Platysma glaucum* Nyl. Common, but not of good form, on aged oaks and pine, Duncombe Park, Rievaulx and Riccal Valley.
- Xanthoria parietina* Th. Fr. Common, walls and farm buildings, Helmsley. Calcareous grit walls, Hawnby and Old Byland. Var. *virescens* Nyl. Calcareous grit walls, Helmsley and Hawnby.
- X. pulverulenta* Nyl. Castle walls, Helmsley.
- X. tenella* Nyl. Calcareous grit walls, Hawnby and Riccal Valley.
- Squamaria saxicola* Poll. Calcareous grit stones of walls, Helmsley and Rievaulx.
- Placodium callopismum* Naeg. Corallian and calcareous grit stones of walls, Helmsley, Hawnby.
- P. sympageum* Ach. Habitat and locality as in previous species.
- Callopisma vitellinum* Sydow. Calcareous grit stones of walls, Helmsley and Hawnby.
- Lecanora calva* Nyl. ex Lamy. Corallian rock exposures, Helmsley.
- L. polytropa* Schaer. Calcareous grit rocks, upper part of Riccal Valley, and Ristbrow, Hawnby.
- L. galectina* Ach. Calcareous grit stones of walls, Duncombe Park, Riccal Valley, Hawnby.
- L. dissipata* Nyl. Calcareous grit stones of walls, Helmsley, Rievaulx and Hawnby.
- L. dispersa* Nyl. On siliceous walls of bridge spanning Rye, Hawnby Road.
- L. crenulata* Nyl. Calcareous rock exposures and walls, Duncombe Park, Hawnby.
- L. varia* Ach. Palings, Duncombe Park, Hawnby.
- L. conizæa* Nyl. Aged hawthorn, pine, Duncombe Park, Hawnby.
- L. symicata* Ach. Palings and pine, Duncombe Park.
- L. atra* Ach. Calcareous grit stones, Helmsley, Hawnby.
- L. parella* Ach. Habitat and locality as in previous species.
- L. Hageni* Ach. Aged oaks, Duncombe Park, Beckdale.
- L. sulphurea* Ach. Calcareous grit stones, Hawnby.
- L. pallida* Schaer. On young ash and sycamore, Duncombe Park, Hawnby.
- L. badia* Ach. Calcareous grit stones of walls, Duncombe Park, Beckdale.
- Pertusaria communis* D.C. Aged oaks and palings, Duncombe Park, Rievaulx, Old Byland.
- P. globulifera* Nyl. Aged oaks, Duncombe Park, Rievaulx.
- P. amara* Nyl. Habitat and locality as in previous species.
- P. lactea* Nyl. Corallian stones, Helmsley.
- P. dealbata*. Calcareous grit exposures, Duncombe Park, Riccal Valley.
- P. Wulfenii* D.C. Aged oak and mountain elm, Duncombe Park.
- Acarospora fuscata* Nyl. Calcareous grit stones, Beckdale.
- A. smaragdula* Koerb. Habitat and locality as in previous species.
- A. pruinosa* Jatta. Aged oak and mountain elm, Duncombe Park, Rievaulx.
- Bæomyces rufus* D.C. Calcareous grit stones, banks of Rye, Hawnby, head of Riccal Valley.
- Cladonia pyxidata* Fr. Most common, moss covered stumps, boulders, dead grass, Helmsley, Rievaulx, Hawnby, Old Byland.
- C. fimbriata* Fr. Amongst mosses, Duncombe Park. Var. *simplex* likewise.
- C. gracilis* Hoffm. and var. *chordalis* Floerke. Amongst bilberry, Duncombe Park and Beckdale; amongst mosses, Riccal Valley.
- C. cervicornis* Schaer. With heath associates in woods, Duncombe Park.
- C. coccifera* Schaer. Habitat and locality as in previous species.
- C. macilenta* Hoffm. Habitat and locality as in previous species; also at Hawnby.

- Cladonia flabelliformis* Wain. Among mosses on old tree stumps, Beckdale, and Riccal Valley. Var. *polydactyla* Wain, Riccal Valley.
- Lecidia confluens* Ach. Calcareous grit stones, Helmsley, Rievaulx, Hawnby.
- L. contigua* Fr. Silicious walls of bridge spanning Rye, Hawnby Road. Var. *platycarpa* Fr. also.
- L. granulosa* Schaer. On humus among bilberry, woods, Duncombe Park.
- L. immersa* Ach. Corallian exposures, Duncombe Park, Riccal, Rievaulx.
- L. querneae* Ach. Aged oaks, Duncombe Park.
- L. parasema* Ach. On ash, Rievaulx.
- L. coarctata* Nyl. Calcareous grit stones of wall at Rievaulx. Var. *elacista* Schaer. Calcareous grit stones, Hawnby.
- L. albo-cærulescens* Nyl. Calcareous grit rocks, Helmsley.
- Opegrapha varia* Pers. Beech trees, Duncombe Park.
- O. vulgata* Ach. Ash trees, Duncombe Park.
- O. saxicola* Ach. On calcareous grit rocks, Helmsley, Rievaulx, Hawnby.
- Rhizocarpon confervoides* D.C. Calcareous grit rocks, Helmsley.
- R. calcareum* Th. Fr. Corallian exposures, Helmsley and Hawnby.
- R. obscuratum* Mass. Calcareous grit stones of wall, Hawnby.
- Verrucaria margacea* Wahl. Calcareous grit stones stream at Rievaulx.
- V. muralis* Ach. Calcareous grit stones, Rievaulx.
- V. calciseda* D.C. Corallian exposures, Duncombe Park, Beckdale, Riccal Valley.
- Polyblastia intercedens*. Amongst dwarf mosses, wall top, Helmsley.

VERTEBRATE ZOOLOGY (H. B. Booth) :—This section was represented by ornithologists, mostly hailing from the West Riding, and it was considered to be one of the best excursions the Yorkshire Naturalists' Union had ever held. This was partly due to the attention and knowledge of Mr. Adam Gordon, and partly to the abundance of animal life in Duncombe Park. The cold winds and scarcity of winged-insect life no doubt accounted for the few bats seen on the wing. The only bat captured was a male *Barbastelle*—a species that is not known to occur elsewhere in Yorkshire.

The work and foot-pad prints of Badgers were frequently seen and in several places nests of young rabbits had recently been dug out. Members had the pleasure of seeing an adult Badger that had been dug out from an 'earth' that day, liberated in the Park. Foxes also appeared to be common, and the British Red Squirrel appeared to be rare, only one being seen. On the other hand the North American Grey Squirrel was fairly common; no doubt descendants of those turned out in Scampston Park. In the Deer Park were several hundred head of both Red and Fallow Deer, but, of course, were not entirely in a feral state.

About seventy species of birds were noted. Pairs of Pied Flycatchers were seen by the score, and pairs of Nuthatches almost by the dozen; in fact it is doubtful if there is any other place in Yorkshire where these two charming species occur in such numbers.

Woodpeckers were more in evidence by their callings, tappings and workings than by actual views of them. Both the Greater-spotted and the Green- were seen, and Mr. Gordon assured us that a pair of Lesser-spotted Woodpeckers was about. The writer had the pleasure of seeing this species in Duncombe Park two years ago. A few pairs of Chiffchaffs were present; and Wood Warblers appeared to be actually more common than Willow Warblers—which is unusual. Among others the following were noted: Goldfinch, Bullfinch, Dipper, Carrion Crow, Tree Creeper, five species of British Titmice, and Kingfisher. The members who crossed the Deer Park to the moorland beyond reported seeing several Curlews. Rooks and Jackdaws abounded, although the ranks of the latter have been greatly depleted the past year or two by the keepers. The Jackdaw's nests we saw contained newly-hatched chicks.

Of the other vertebrates, little of importance was noticed. Two half-grown newts, taken a good distance from water, were identified by Mr. C. F. Procter as the Common or Smooth Newt (*M. vulgaris*).

CONCHOLOGY (Greevz Fysher):—The gatherings made have been submitted to Mr. John W. Taylor, M.Sc., who gives the following list:—

<i>Helicigona lapicida</i> var. <i>nigrescens</i>	}	Garden Wall opposite Church, Rievaulx.
<i>H. arbustorum</i> var. <i>thomasia</i>		
<i>Helix hortensis</i> var. <i>lutea</i>		
<i>Clausilia bidentata</i>		
<i>Helix aspersa</i>	}	Clay deposits, Byland Abbey.
<i>Theba cantiana</i> , numerous, all adolescent		
<i>Hygromia rufescens</i>	}	Baxton Road, Helmsley.
<i>H. hispida</i>		
<i>Helix hortensis</i> var. <i>lutea</i>		
<i>Xerophila caperata</i>		
<i>Hyalinia cellaria</i> and var. <i>albina</i>		
<i>Zua lubrica</i>		
<i>Clausilia bidentata</i>		
<i>Hygromia rufescens</i>	}	"Fairyland," over Rye Bridge, Helmsley.
<i>Helix aspersa</i> and var. <i>undulata</i>		
<i>Succinea putris</i> , abundant		
<i>Helicigona arbustorum</i>		
<i>Helicigona arbustorum</i> and v. <i>fuscescens</i>	}	Duncombe Park, Helmsley.
<i>Helix hortensis</i> var. <i>lutea</i>		
and var. <i>albescens</i>		
<i>H. aspersa</i> var. <i>undulata</i>		
<i>H. nemoralis</i> var. <i>rubella</i>		
<i>H. nemoralis</i> var. <i>carnea</i>		
<i>Hyalinia cellaria</i>		
<i>Clausilia laminata</i>	}	Beckdale, near Helmsley.
<i>Vitrina pellucida</i> (dead)		
<i>Ena obscura</i>		
<i>Clausilia bidentata</i>		
<i>Limnæa peregra</i>		
<i>Ancylus fluviatilis</i> var. <i>depressa</i>		
<i>Pyramidula rotundata</i>		
<i>Hygromia hispida</i>	}	Helmsley.
<i>H. fusca</i>		
<i>Ena obscura</i>		
<i>Clausilia laminata</i>		
<i>C. bidentata</i>		
<i>Pupa umbilicata</i> and var. <i>edentula</i>		
<i>Limnæa peregra</i>		
<i>Hyalinia cellaria</i>		
<i>H. nitidula</i>		
<i>H. pura</i>		
<i>H. crystallina</i>		
<i>Conulus fulvus</i>		
<i>Zonitoides nitidus</i>		
<i>Pyramidula rotundata</i>		
<i>Helix hortensis</i> var. <i>lutea</i>		
<i>Hygromia hispida</i>		
<i>Ena obscura</i>		
<i>Pupa umbilicata</i>		
<i>Hyalinia cellaria</i>		
<i>H. alliaria</i>		
<i>H. crystallina</i>		
<i>Clausilia laminata</i>		
<i>H. bidentata</i>		
	}	Wood, Griffs Farm, between Helmsley and Rievaulx.

DIPTERA (Chris. A. Cheetham):—The weather conditions were unfavourable for diptera collecting until Monday, when at last the sun came out; a start was made at Quarry Bank Wood and the river side towards Rievaulx, thence forward to Greencliffe Wood and the open streamside below Ristbrow, finishing in the woods on the south side of Gowerdale, near Hawnby. For so early in the season surprising numbers of diptera were taken and, showing the paucity of information from this vice-county, 67 of them (*) have not been previously recorded for the area. Eight species (†) have not been recorded from any part of the county previously. The district would evidently repay a regular worker in this group.

- Sciara* spp.
 **Mycetophila fungorum* Dz. (*punctata* Mg.).
 **M. vittipes* Ztt.
Rhymosia spp.
 **Allodia lugens* Wied. (*ornaticollis* Mg.).
Exechia sp.
Phronia sp.
Boletina trivittata Mg.
 **Apoliphthisa subincana* Curt. (*Tetragoneura melanoceras* Hal.).
 †*Mycomyia wankowiczii* Dz.
 †*Boletophila tenella* Winn.
Bibio marci L.
 **B. venosus* Mg.
 **B. varipes* Mg.
B. laniger Mg.
 **Simulium reptans* L.
Limnobia nubeculosa Mg.
 **Empida nubila* Schum.
 **Molophilus ater* Mg.
 **Erioptera tenionota* Mg.
E. trivialis Mg.
 **Ephelia marmorata* Mg.
 **Limnophila meigenii* Verr.
 **L. ferruginea* Mg.
 **Amalopsis immaculata* Mg.
 **Tipula marmorata* Mg. (*confusa* v.d. Wulp.).
 **T. hortulana* Mg.
 **T. vittata* Mg.
 **Rhyphus punctatus* F.
Bombylius major L.
 **Rhamphomyia sulcata* Flin.
 **Empis bilineata* Lw.
 **E. tessellata* F.
 **Hilara maura* F.
 †*Euthyneura myricæ* Wlk.
 **Empis chiroptera* Flin.
 **Ardoptera guttata* Hal.
 **Lonchoptera lutea* Pz.
 **Orthoneura brevicornis* Lw.
 **Chilosia maculata* Flin.
 **C. antiqua* Mg. (*sparsa* Lw.).
 **C. pagana* Mg. (*pulchripes* Lw.).
 †*C. vulpina* Mg.
 **C. bergenstammi* Beck.
 †*C. ruralis* Mg. (*præcox* Sch.).
 **C. proxima* Ztt.
Platychirus manicatus Mg.
 †*P. discimanus* Lw.
P. albimanus F.
P. immarginatus Ztt.
Melanostoma scalare F.
Leucozona lucorum L.
 **Syrphus venustus* Mg.
S. ribesii L.
S. luniger Mg.
S. cinctellus Ztt.
Sphærophoria scripta L.
 **Ascia podagrica* F.
Rhingia campestris Mg.
 **Eristalis nemorum* L.
E. pertinax Scop.
E. horticola Deg.
 **Myopa buccata* L.
 **Siphona cristata* F.
Onesia sepulchralis L.
 **O. cognata* Mg.
Pollenia rudis F.
 **Pyrellia serena* Mg.
 **Lucilia cæsar* L.
 **Hydrotæa dentipes* F.
 **Trichopticus mutatus* Fall. (*semipellucidus* Ztt.).
 **T. pulcher* Mde.
 **Hylemyia nigrimana* Mg.
 **Anthomyia pluvialis* L.
 **Chortophila brassicæ* Bouché (*Phorbia floccosa* Mcq.).
 **Fannia acrea* Mg. (*Homalomyia*).
 **Azelia macquarti* Staeg.
 **Cælogyia mollissima* Hal.
 †*Amaurosoma fasciata* Mg.
Dryomyza flaveola F.
 **Psila nigricornis* Mg.
 **P. atra* Mg.
 **Ptilonota guttata* Mg.
 **Spilograpta zoë* Mg.
 **Balioptera tripunctata* Flin.
 **Nemopoda cylindrica* F.
 **Themira putris* L.
 †*Scaptomyza tetrasticha* Beck.
 **Cyloropisca notata* Mg.
 **Elachyptera cornuta* Flin.
 **Borborus nitidus* Mg.
 **B. geniculatus* Mcq.

COLEOPTERA (Mr. M. L. Thompson):—During an investigation of Duncombe Park and Beckdale, the following interesting beetles, among many more or less common species, were met with, *Tachyusa leucopus* Marsh (*flavitarsis* Sahl.), *Philonthus fulvipes* F. (both in wet shingle on the banks of the Rye), *Catops (choleva) kirbyi* Spence, *Micrurula melanocephala* Marsh, *Phyllotreta atra* Payk., and *Ceuthorrhynchus asperifoliarum* Gyll. (on *Myosotis*).

Members investigating Riccal Dale found *Clythra quadripunctata* L. in some numbers about the nests of *Formica rufa*. The larva of the insect is reared in the nests of this ant.

—: o :—

NEWS FROM THE MAGAZINES.

P. G. Ralfe contributes 'Manx Ornithological Notes,' to *British Birds* for June.

W. J. Lucas contributes his 'Notes on British Orthoptera in 1922' to *The Entomologist* for May.

'*Porotrichum angustifolium* in Ireland,' by H. N. Dixon, appears in *The Irish Naturalist* for May.

'Some Lesser Known Bees and Wasps,' by Donald Payler, are referred to in *The Animal World* for April.

W. J. Lucas contributes 'Notes on British Paraneuroptera (Odonata) in 1922' to *The Entomologist* for June.

Sir Arthur Shipley writes on 'Suspended Animation—I. Tardigrades, Rotifers and Nematodes,' in *Discovery* for June.

Ours, the magazine of Reckitt's, for May, contains a lengthy note on 'The Isle of Axholme,' with many illustrations.

'Mutual Co-operation between Museums and Public Libraries,' is the title of a paper by R. W. Brown in *The Museums Journal* for May.

No. 8 of *The Australian Museum Magazine*, edited by Dr. C. Anderson, is particularly well illustrated, and should do much to popularise the Museum.

Mr. Robert Welch, one of the editors of *The Irish Naturalist*, has had the degree of Master of Science, *honoris causa*, conferred upon him by the Queen's University, Belfast.

A. E. Wildman, having described *Nyctipao albicinata obscura*, and finding that the name had previously been given, renames his aberration *obscurata* (*The Entomologist*, May).

The stormy petrel, herons, wrens, plant rosettes, trout, earwig and vole are some of the objects which are well illustrated and described in Part 6 of *The Pageant of Nature* (Cassell & Co., 1/3).

In his Presidential Address to the British Ecological Society (*Journal of Ecology*, p. 122), Dr. R. Lloyd Praeger refers to an excellent dinner he had at Hull, at which he came out of the same door as in he went. We are glad he did not use the window as an exit!

Seed Mixtures for Grassland, by R. G. Stapledon; The 'Ring-Spot' and 'Rust' Disease of Lettuce, by E. S. Salmon and H. Wormald; and Hoary Pepperwort or Thanet Weed, by G. H. Garrad are among many matters discussed in *The Journal of the Ministry of Agriculture* for May.

The Contents of *The New Phytologist* for May includes 'An Example of Leaf-enation in *Allium ursinum* L.,' by S. L. Ghose; and 'Permeability: Quantitative Relations in the Penetration of Dissolved Substances into Plant Cells,' by Walter Stiles, as well as with other interesting articles.

The Journal of Ecology for May deals with 'The Causes of Failure of Natural Regeneration of the Beech,' by A. S. Watt; 'Carrington Moss, with special reference to the Weeds of Arable Ground,' by E. Price Evans; 'Distribution of the Marine Flora of the Channel Islands compared with that of the Coasts of Western Europe,' by L. Lyle; '*Spartina townsendii* on the Dovey Salt Marshes,' by R. H. Yapp.

NORTHERN NEWS.

Dr. A. B. Rendle has been appointed President of the Linnean Society. Surely it is time one of our contemporaries dropped the heading 'Original Articles' for a section of its journal?

We regret to learn of the death of E. C. R. Armstrong, until recently Keeper of the Irish Antiquities in the National Museum, Dublin.

There are two Yorkshire specimens figured in Part 39 of Buckman's *Type Ammonites*, viz., *A. silphonensis* from Silphone Moor; and *A. cornucopia* from Whitby.

The death is announced of Joseph Wright, of Belfast, at the age of eighty-nine. He was a typical 'all-round' naturalist of the old school, and devoted much attention to the foraminifera.

We have been favoured by Professor Sir William Boyd Dawkins with his Presidential Address to the Somersetshire Archaeological and Natural History Society, entitled 'The Ethnology of Somerset from the Neolithic Age to the Close of the Roman Dominion.'

From the Camping Club of Great Britain and Ireland we have received a list of their fixtures for 1923, from which it is clear that the members are catered for in all parts of the country, Yorkshire taking a good share. The Club's address is 4 New Union Street, London, E.C.2.

Judging from the York and District Field Naturalists' Section of the Yorkshire Philosophical Society, and the Halifax Scientific Society, the syllabuses of which have recently reached us, the Field Naturalists' societies in our county are getting into their old line, and meetings and excursions are being held as they were before the war.

The fortnightly parts of Hutchinson's *Animals of All Countries* appear regularly, with attractive coloured covers, and, as regards illustrations, each is quite up to the standard of the first, already noticed in these columns. Part II. deals principally with the Apes; Part III. largely with the Bats; Part IV., Lions and Tigers; Part V., Cats; Part VI., Dogs and Bears; and Part VII., Martens, Badgers and Seals; the last-named being of more than usual interest to northern naturalists.

We are not quite certain whether the following paragraph is intended to be a report of a scientific excursion or not: but we quote it precisely as it appeared in a recent issue of *The Hull News*:—'How can you wake of a morning withoht this country by the Lambards. Lb. is sodi—shillings, and denari—uence, derived pounls, shillings and pence. The letters ninety throshing another of seventy. a woman—can't keep a sedret.'

The annual meeting of the *Doncaster Scientific Society* was held recently, and the report shewed that in connexion with indoor meetings, and field excursions—healthy activity was revealed. Experimental winter field meetings, each being largely devoted to one particular subjects had been quite successful and well attended. The number of members on the Society's roll was stated by the retiring Hon. Secretary and Treasurer (Mr. S. Baker) to be 147. Mr. Baker also presented a balance sheet, and a considerable discussion ensued. The President (Mr. A. A. Dallman) said the Committee was of the opinion that there was need for reorganisation in certain directions, but owing to circumstances beyond their control the matter could not be dealt with that evening. At a subsequent special meeting some amendment of rules, made in accordance with previous proposals, was agreed upon. The new President is Mr. E. Stainton, an enthusiastic worker, who has done much useful service, and especially in connexion with his special studies, Conchology, Microscopy and Pond Life. In accordance with the new rule two secretaries (Scientific and General) were appointed, and the treasurership was made a separate office to be held by a different person. Mr. S. Baker and Mr. T. W. Saunders, were elected in place of two retiring Vice-Presidents. The new officials are Mr. J. Beetham and Major G. W. Phillips, General Secretary and Treasurer respectively. Mr. A. A. Dallman (the Secondary School, Mexborough) was appointed Scientific Secretary.

HANDBOOK TO HULL AND THE EAST RIDING OF YORKSHIRE

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THE ADVANCEMENT OF SCIENCE

EDITED BY

T. SHEPPARD, M.Sc., F.G.S.

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Pursuant to the Act of Parliament, 22nd and 23rd Vic., cap. 35, intituled
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NOTICE is hereby given that all persons having claims against the estate of the above John Daniel Hamlyn, late of 221 St. George's Street, St. Georges in the East, in the County of London, Naturalist and Dealer in Animals and Birds, who died on the 25th of February, 1923, and whose will was proved in the Principal Registry of the High Court of Justice on the 11th day of April, 1923, by his Widow and Executrix, Louisa Josephine Marie Hamlyn, are hereby required to send particulars of their claims to Adolph Una Seeley, Solicitor, c/o Messrs. Seeley & Son, of 2 South Square, Grays Inn, London, W.C.1, on or before the 22nd day of September next, after which date the said Executrix will proceed to distribute the assets of the said deceased amongst the persons entitled thereto, having regard only to the claims of which she shall then have had notice and that she will not be liable for the assets so distributed to any persons or person of whose claims she shall not then have had notice.

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The Museums, Hull;

AND

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JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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YORKSHIRE NATURALISTS' UNION:

GALLS COMMITTEE AND ENTOMOLOGICAL SECTION.

JOINT FIELD MEETING, GRASSINGTON, AUGUST 18th, 1923.

Members meet at Grassington Station at 12-17 p.m. on the arrival of the 10-35 a.m. trains from both Leeds and Bradford.

Return trains leave Grassington for Leeds and Bradford at 5-10 and 7-14 p.m.

Members and Associates of the Union cordially invited.

B. MORLEY, *Secretary*.

MARINE BIOLOGY COMMITTEE.

THE ANNUAL MEETING of the Committee will be held at Scarborough from September 26th to September 28th. Members meet at the northern end of the Bathing Pool, on September 26th, at 10 a.m. Details for the second and third days will be arranged at the first meeting.

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NOTES AND COMMENTS.

ANOTHER MYSTERY.

The daily press informs us that 'The presence of a marine monster of a hitherto unknown species has been reported. Several people report having seen it. The most reliable of these are two middle-aged fishermen, of whose statement no doubt is entertained, both of them being sober [!], trustworthy men. The two fishermen were out in a row boat in the fjord, fishing close under the land, when they observed a remarkable animal swimming along the surface of the water. They rowed nearer, very cautiously, and noticed that its ears were large, about the size of a man's hand, and set well back in the head. When the boat came close to it the creature suddenly dived, and swam under water right past the fishermen. The surface of the water was clear and still, and they were able to watch the animal as it passed beneath them in about six feet of water. The animal was rather larger than a setter, and of a ruddy brown colour. The body was round, but the fishermen were unable to note whether it was hair-covered or not. It had a tail of about 30 inches long, and heavy flippers, with which it propelled itself. The men state most emphatically that it was neither a seal nor an otter.—Reuter.' Yet it is 'a hitherto unknown species.' However, it is cheering to note that the observers were sober !

EAST RIDING ANTIQUARIAN SOCIETY.

Volume XXIV. of *The Transactions of the East Riding Antiquarian Society** is a record of the interests and activities of the Society in the years 1921 and 1922, which moves the reader to the comforting reflection that there is little of archæological value which comes to light from time to time in the East Riding that is likely to escape the vigilance of those who are in charge of the Society or that will fail to be placed on permanent record in the pages of its *Transactions*. In the present volume, for instance, there are the records of recent prehistoric finds, which include stone axe-hammers, flint axes and knives, and bronze palstaves from the Wolds and elsewhere ; a remarkable Romano-British urn of unusual size from Holderness is described ; and an account is given of the objects of Roman age from Middleton-on-the-Wolds found in the course of excavations conducted by Mr. Sheppard.

REMARKABLE FIND.

Among the last named is a remarkably fine bone ring which is noteworthy. Mr. Sheppard is also responsible, among other matters, for the description of a Saxon gold ring

* Vol. XXIV., 1923, pp. xvi.+91, with 4 plates.

found at Driffild which has a curious history. Its existence was suspected many years ago, but it was only recently that it was acquired by purchase in London and placed in its proper resting place in the Museum at Hull. Apart from its history the ring is of considerable interest on account of its decoration and technique. Mr. Sheppard is able to figure a number of parallels, some of which, it is not surprising to note, come from Sweden, though they are of earlier date. Mr. Sheppard's comparison of the maze on a Roman pavement at Harpham with a maze of similar design found at Pompeii, in addition to its bearing on the form of these constructions, is significant in reference to the origin and distribution of the decorative motives of East Yorks. It is hardly necessary to state that the contents of the volume are by no means confined to antiquities of prehistoric date. Among a number of contributions which deal with antiquities of a later age, mention must be made of a communication on 'Lowthorpe and its Collegiate Church of St. Martin,' by the Rev. C. V. Collier, and on 'The Origin of Heraldry,' by Col. Philip Saltmarsh. In the latter the author makes an interesting suggestion that similarity in arms borne by different families is sometimes to be accounted for by permission given to tenants to bear the arms of their overlords rather than by relationship. This suggestion points to a line of research which may prove of the greatest assistance to writers on local history and genealogists. An illustrated account of the tercentenary celebrations of Andrew Marvell includes characteristic addresses on the poet by the Rt. Hon. Augustine Birrell and Sir A. K. Rollitt.

LOCAL ASPECT.

In concluding this brief notice of an interesting collection of papers, it must be acknowledged that stress has been laid upon the local aspect which it is an important, if not the primary, function of a local society to keep to the fore. It would give a wrong impression if emphasis were not also laid on the fact that most of the articles are written with an appreciation of the trend of archæological studies at the moment which will help to place them in their proper perspective when we come later to take stock of our historical material as a whole.—E.N.F.

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Practical Taxidermy, by **Montague Browne** and **G. E. Bullen**. London: Bazaar Exchange and Mart xiv.+281 pp., 7/6 net. Montague Browne was the Curator at the Museum at Leicester, and his work on taxidermy particularly appealed to the amateur naturalist. The present is the third edition, and has been revised and brought up to date by Mr. G. E. Bullen of the Hertfordshire County Museum, St. Albans. Almost every aspect of taxidermy seems to be dealt with, and there are particularly good chapters on the difficult question of mounting fishes. The authors discuss the cases, mounts, artificial rock work, etc., and even deal with 'natural history jewellery.'

FULMAR PETRELS, ETC., ON THE YORKSHIRE CLIFFS.

H. B. BOOTH, F.Z.S., M.B.O.U.

MAY 26TH being the first anniversary of the gathering of the first Fulmar's eggs in England (*The Naturalist*, 1922, p. 201), I spent the whole day on the Speeton and Bempton cliffs, in company with Mr. F. H. Edmondson, the Hon. Secretary of the Yorkshire Naturalists' Union's Birds and Eggs Protection Committee. This Committee has already succeeded in getting the North and East Riding County Councils to protect the eggs of the Fulmar Petrel for five years, in order to give them a chance to become established as a breeding species, and placards to that effect were posted on the cliff tops. I worked the whole of the higher cliffs—starting at the Speeton end; rejoined Mr. Edmondson at Bempton, and then went south until where the cliffs descend to the North Landing of Flamborough. I was simply astounded at the number of Fulmars present; they continued the whole distance of the higher cliffs—some three or four miles. There were hundreds upon hundreds of them. On the northern (or Speeton) half of the higher cliff they were evidently immature non-breeding birds, and I never saw one settle on the cliff, but some were on the sea. They appeared to spend their whole time in sailing round on motionless wing, pretending they were going to settle at certain points, but never actually settling, although on many occasions they actually dropped their legs as they neared the cliff—then sailing round the same circle (or, more correctly, oval) again. This continued for quite two miles, and although I was delighted to see, and to watch the birds, yet it became rather monotonous, and not a little irritating, as I wished to see if the birds were nesting. It was not until I got to Bempton that I actually saw a bird on the cliff face. Then there were dozens, and they continued in small parties as far as I went.

Several of the birds were apparently brooding, and in two cases we actually caught a sight of the egg. In many cases the 'climbers' are respecting the protection order, and leaving the Fulmar's eggs; in fact, we saw one 'climber' pass close to two brooding birds. But by the number and quality of the egg-collectors on the cliff top, no doubt the 'climbers' are being bribed to bring a few Fulmars' eggs up when all is apparently clear. It was amusing how quickly the word was passed along that Mr. Edmondson was on the cliffs. I had the 'tip' given me when I was quite two miles away from him! But these bribers are making very

poor bargains ; because if this great invasion of Fulmars continues and increases, in a few years' time they will be able to get fifty or sixty of their eggs from the 'climbers' for the price they are now paying for one. The Fulmars, for the most part, are occupying, or flying round, the upper portion of the cliff, that is, about two-thirds to three-fourths of the way up. They add a great additional interest and pleasure to these already celebrated bird-cliffs.

I hear from Mr. Snowdon, of Whitby (through Mr. Edmondson), that Fulmars have now taken up positions on several sea cliffs in the North Riding, including Kettleness. Probably these will be immature birds like the earlier birds that came to Bempton.

It is nine years since I so thoroughly worked these cliffs in the full nesting season, and I was greatly surprised at the great increase in nesting Kittiwakes. There will be quite twice or thrice the number nesting there now to what there was in 1914. Razorbills appear to me to have rather increased, and Herring Gulls to have slightly decreased.

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Part XVII. of **A Practical Handbook of British Birds**, published by Messrs. H. F. & G. Witherby (79 pp., 4/6 net) has appeared. It is well illustrated as usual, and deals with the Gulls, Skuas, etc.

John Lane, at the Bodley Head, has issued a little Handbook on **Well**, by **Francis, Lord Latymer**, with the assistance of the **Rev. F. Redmayne** (41 pp., 1/- net). There are illustrations of the exterior of Well Church, a fine old building ; Tomb of John, 4th Lord Latymer ; and of Snape Castle.

Practical Plant Ecology, by **A. G. Tansley, M.A., F.R.S.** London : Allen & Unwin, pp. 220, 1923, 7s. 6d. net. Mr. Tansley has rendered a signal service to botany by the issue of this work. If botany, or even biology, in its widest sense, is to take its true place in our scheme of education, it is stress on the ecological outlook which will secure this purpose. Plants 'form a natural framework for the study of the living populations of the globe,' and until this is fully realised and made the basis of our teaching from the ecological point of view, we can never give the child and student the true perspective of life as a whole. Further, botany brings together the several specialised branches, not only of botany, but of other sciences, and shows the need for their co-ordination. In this book the author, after an account of natural and semi-natural vegetation, deals clearly with the structure, distribution, and development of vegetation ; methods of studying vegetation ; the habitat ; and finally a useful section of ecological work in schools. In an appendix there are sections on life forms ; methods of surveying ; photography ; Hydrogen-Iron concentration and determination of salts in the soil ; also a useful list of books and papers on ecology. There are fifteen text figures and diagrams. The book is written with Mr. Tansley's usual clearness of style, and is intended for the adult rather than the young beginner, but it is exactly what the field botanist and teacher needs. It is unfortunate that ecology is becoming overburdened with so many uncouth and unnecessary technicalities, but the author has made a serious effort to reduce these to relatively narrow limits. He has dealt with a difficult subject in such an able manner as to provide a work which will be a help and stimulus to all who desire a fuller knowledge and insight into a subject of fundamental importance.

ADDITIONAL NOTES ON THE APTERYGOTA OF YORKSHIRE AND DERBYSHIRE.

JAMES M. BROWN, B.Sc., F.L.S., F.E.S.

SINCE my previous papers dealing with the Thysanura and Collembola of these two counties (*The Naturalist*, June, 1918, and February, 1919), further search has resulted in a number of additional species being found, mostly inconspicuous forms rarely seen, and in the discovery of new localities for some of those previously obtained. Very little attention is still being given to these small but highly interesting insects, and I have to rely, as before, mainly on my own work with the group for additional records. A few notices have been published since my last list, in which one or two Yorkshire localities are given. These are referred to in connection with the species mentioned below.

Sufficient work has not yet been carried out with the group to warrant any very definite conclusions being drawn regarding their distribution in Britain, but it seems probable that most, at any rate, are widely scattered over the country, while a certain number do appear to be more restricted in their range, some, as noted below, being more plentiful in the south than in the north. A further point of interest not yet sufficiently worked out is the relative abundance of different species at different seasons of the year. Numbers of species of Collembola are certainly more numerous in the winter months, others seem more plentiful in the early spring. This is probably rather a question of moisture than of difference in temperature, most of the Collembola being unable to survive in a dry atmosphere.

As in previous lists the Derbyshire localities are marked *.

Order : COLLEMBOLA.

Family : PODURIDAE.

Achorutes purpurescens Lubbock. often occurs in very large numbers in autumn and spring, and is then frequently found exposed on walls and similar places (see *The Naturalist*, 1921, p. 130). These specimens are mostly of a very deep purple-black. Totley,* Ryecroft Glen,* Whirlow. A much paler form occurs sometimes under bark, or in rotting wood. Totley.*

A. viaticus (L.) Tullberg. is most often found at or near the sea coast. It has been obtained in very large numbers among rotting seaweed at Robin Hood's Bay.

Xenylla brevicauda Tullberg. is apparently an uncommon species. It was taken under the bark of a tree-stump at Grindleford,* in small numbers. The most common and widely distributed member of this genus with us appears to be *X. grisea* Axelson. which is also found under bark. Ecclesall Woods, Ryecroft Glen.*

Pseudachorutes asigillatus Born. is another sub-cortical species, but is not at all common. It has been obtained on several occasions

- under the bark of birches which were attacked by *Polyporus betulinus* in Ecclesall Woods, Sheffield. What I believe to be the eggs of this species were noted in April.
- P. corticicolus* (Schaff.) Krausb. Like the preceding species, this also lives under the bark of decaying trees, but seems still less common. I have taken it only at Totley.*
- Friesia claviseta* Axels. may also be obtained beneath the bark of fallen birches in Ecclesall Woods.
- F. mirabilis* (Tullb.) D.T. frequently found in similar situations to the last, is sometimes fairly plentiful in moss. Wharncliffe, Totley,* Grindleford.*
- Onychiurus fimetarius* (L.) Lubbock. lives under stones and among decaying leaves, Grindleford,* but is much less plentiful than some other members of the genus, e.g., *O. armatus* (Tullb.) or *O. ambulans* (L.).
- Tullbergia krausbaueri* (Born.) may be taken in moss and in humus, but is not plentiful with us. Grindleford.*
- Anurida maritima* (Guer.) Laboulb. is one of the coastal species, and is frequently very numerous on the surface of the sea in rock-pools at various places on the Yorkshire coast. Scarborough, Whitby, Robin Hood's Bay.
- A. granaria* (Nic.) Tullb. This inconspicuous species occurs in damp soil under stones, and seems scarce. It may, however, be more common than it appears, as it is easily overlooked. Ecclesall Woods.

Family: ENTOMOBRYIDAE.

- Anurophorus laricis* Nic. has been taken at different times under boards, dung, in wet sphagnum, on the surface of puddles, and under bark. This last is probably its usual habitat. I have obtained it in quite large numbers under the loose bark on old larch posts in Lathkil Dale,* in company with *Xenylla grisea* and *Isotoma cinerea*, during May.
- Isotoma sensibilis* Tullb. is one of the common species which may be taken in moss, dead leaves and humus, or under bark. Austwick (in moss on old walls during winter, see *The Naturalist*, 1921, p. 167), Millhouses, Wharncliffe, Grindleford.* It was especially numerous at the last named place in moss during May last, young individuals of various ages being present along with adults.
- I. olivacea* Tullb. The only locality where I have obtained this uncommon form was near Bridlington.
- I. minor* Schaff. is one of the characteristic moss-inhabiting species. It is small, colourless and eyeless. It was plentiful in moss gathered at Grindleford.* It frequents also humus and dead leaves, (see *The Naturalist*, 1919, p. 64).
- Tomocerus* (*Pogonognathus*) *longicornis* (Muller) Lubbock. is very plentiful in the south of England, and in such places as the Isle of Wight and on the Sussex coast it is the commonest member of the genus. In the north it is much rarer. It has, however, been recorded for the Clyde Area by the late Mr. W. Evans. My only record for it in this part of the country refers to one specimen which I took on the North Cliffs, Bridlington, in August, 1922.
- Orchesella villosa* (Geof.) Lubbock. is another species which is more often obtained in the south than the north. I have taken it very occasionally under logs and stones at Bakewell* and Cordwell,* and on one occasion in considerable numbers under pieces of limestone by the riverside in Lathkil Dale.*
- Heteromurus nitidus* (Templ.). A white, shining species which occurs fairly commonly in company with species of *Lepidocyrtus* under stones. Millhouses, Ashover,* Grindleford,* Whirlow.

Family : SMINTHURIDAE.

Sminthurides malmgreni (Tullb.) var. *elegantula* (Reut.). This active little species is found on Scarborough Mere in plenty, as is usual when it occurs at all. It is frequently in company with *Isotomurus palustris* (Mull.).

Sminthurinus aureus (Lubb.). The type form, a bright yellow insect, is less frequently met with than the black variety *ochropus* (Reut.). I have obtained the former on several occasions under fallen branches in Monk Wood* and in Ecclesall Woods in winter time, and during May in moss at Millhouses and Grindleford.* The var. *ochropus* is now and again met with in extraordinary numbers. On one occasion at Totley* swarms were found in association with the dark form of *Achorutes purpurescens* noticed above, and curiously, with a considerable number of *Entomobrya albocincta* (Templ.), which is more at home on tree trunks. These were all wandering about on an exposed wall. Why they should have been associated together in such large numbers is difficult to understand.

Arrhopalites binoculatus (Born.) has been recorded by Mr. R. S. Bagnall from Ravenscar, where it occurred in sphagnum (*The Vasculum*, 1921, p. 14).

Bourletiella hortensis (Fitch) is frequently found in gardens on the soil and pathways. Millhouses (Sheffield). Considerable numbers were collected from the pathway in Lathkil Dale* during August. The yellow variety *juvenalis* Fitch has occurred on plants in the garden at Millhouses.

B. bicinctus var. *repanda* (Agr.) Axels. is common among grass and on various plants. Bridlington, Scarborough.

Allacma fusca (Linn.) seems to be one of the rarer species. In Derbyshire I have swept it once only from moist vegetation, and in very small numbers, at Bakewell.*

Order : THYSANURA.

Family : CAMPODEIDAE.

Campodea staphylinus Westw. is the commonest species of the genus, and occurs under stones almost anywhere.

C. fragilis Mein. is much less frequently met with. It has occurred under dry dung in a cornfield Cordwell,* and among dead leaves in Ecclesall Woods. It has also been obtained at Weedly, near South Cave by Mr. T. Stainforth (see Mr. R. S. Bagnall in *E.M.M.*, 1918, p. 109)

C *S. gardneri* Bagn. is probably more widely distributed. It has occurred at Grindleford,* and has been taken by Mr. Stainforth at Hull (see Mr. Bagnall's article, *E.M.M.*, 1918).

C *S. lankesteri* Silv. was taken by Mr. Stainforth at Hull (see *E.M.M.*, 1918).

Family : MACHILIDAE.

Praemachilis hibernica Carp. A common species found under limestone rocks in various places in Derbyshire, Calver,* Ashover,* etc.

Petrobius carpentari Bagn. occurred plentifully at dusk running about the sea wall, Scarborough. With specimens I collected in August, were associated several mites, which have been identified by Rev. J. E. Hull as *Gamasus coleoptratorum* L. and *Macrocheles glaber* Müll., species usually found on dung beetles.

Family : LEPISMIDAE.

Lepisma saccharina L. I recently found a specimen of this common species in a perfectly active condition, running about in a waste

sink-bowl in a chemical laboratory in Sheffield, an uncomfortable sort of place for an insect that delights in the warmth of fire places. It has been reported from Scarborough by Mr. G. B. Walsh (see the *Naturalist*, 1923, p. 91). It is also known from Leeds, and probably occurs in most towns.

Themobia furnorum Rovelli has been found in bakehouses in Scarborough (see G. B. Walsh in *The Naturalist*, 1923, p. 91). The species lives commonly in the open in more tropical countries, and is most likely an introduced species in this country.

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PLEISTOCENE BIRDS' REMAINS FROM CHUDLEIGH.

E. T. NEWTON, F.R.S., F.G.S.

IN *The Naturalist* for August and September, 1922, page 151, Mr. A. Bell published an interesting list of Fossil Birds, 'Pleistocene and Later Birds of Great Britain and Ireland,' and included among them a number of species found in a fissure deposit at Chudleigh, Devon; by that indefatigable worker, Mr. A. S. Kennard, which had been kindly submitted to me for examination. Further collecting by this gentleman from the same deposit revealed a still larger number of Avian remains, many belonging to unrecorded species, a list of which is given below. Many of these are referable to Passerine birds, some of which are not easy of specific determination, and their reference can only be accepted as approximately correct.

BIRDS' REMAINS FROM THE CHUDLEIGH FISSURE DEPOSIT NOT RECORDED IN MR. A. BELL'S LIST.

Missel Thrush	<i>Turdus viscivorus</i> Linn.
Song Thrush	<i>T. musicus</i> Linn.
Red Wing	<i>T. iliacus</i> Linn.
Blackbird	<i>T. merula</i> Linn.
Whinchat	<i>Pratincola rubetra</i> Linn.
Redstart?	<i>Ruticilla phoenicurus?</i> Linn.
Robin?	<i>Erithacus rubecula?</i> Linn.
Whitethroat	<i>Sylvia cinerea</i> Bechst.
Hedge Sparrow	<i>Accentor modularis</i> Linn.
Dipper	<i>Cinclus aquaticus</i> Bechst.
Nuthatch	<i>Sitta cæsia</i> Wolf.
Wren	<i>Troglodytes parvulus</i> Koch.
Pied Wagtail	<i>Motacilla lugubris</i> Temm.
Titlark	<i>Anthus pratensis</i> Linn.
Rock Pipit	<i>A. obscurus</i> Lath.
Tree Creeper	<i>Certhia familiaris</i> Linn.

Goldfinch	<i>Carduelis elegans</i> Steph.
Hawfinch	<i>Coccothraustes vulgaris</i> Pall.
House Sparrow	<i>Passer domesticus</i> Linn.
Linnet	<i>Linota cannabina</i> Linn.
Corn Bunting	<i>Emberiza miliaria</i> Linn.
Yellow Bunting	<i>E. citrinella</i> Linn.
Starling	<i>Sturnus vulgaris</i> Linn.
Chough	<i>Pyrrhocorax pyrrhocorax</i> Linn.
Jackdaw	<i>Corvus monedula</i> Linn.
Skylark	<i>Alauda arvensis</i> Linn.
Shore Lark?	<i>Otocorys alpestris</i> ? Linn.
Great Spotted Woodpecker	<i>Dendrocopus major</i> Linn.
Little Owl	<i>Athene noctua</i> Scop.
Kestrel?	<i>Falco tinnunculus</i> ? Linn.
Grey Goose	<i>Anser cinereus</i> Meyer.
Wild Duck	<i>Anas boschas</i> Linn.
Smew?	<i>Mergus albellus</i> ? Linn.
Wood Pigeon	<i>Columba palumbus</i> Linn.
Red Grouse	<i>Lagopus scoticus</i> Lath.
Ptarmigan	<i>L. mutus</i> Montin.
Pheasant?	<i>Phasianus colchicus</i> ? Linn.
Fowl	<i>Gallus bankivus</i> ? Tessin.
Partridge	<i>Perdix cinerea</i> Lath.
Quail	<i>Coturnix communis</i> Bonnat.
Ring Plover	<i>Ægialitis hiaticula</i> Linn.
Lapwing?	<i>Vanellus vulgaris</i> ? Bechst.
Jack Snipe	<i>Gallinago gallinula</i> Linn.
Knot?	<i>Tringa canutus</i> ? Linn.
Whimbrel	<i>Numenius phæopus</i> Linn.
Little Auk	<i>Mergulus alle</i> Linn.
Black Guillemot?	<i>Uria grylle</i> ? Linn.

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Our Bird Friends : Their food, feathers, flight, nests, eggs, young, songs and call notes ; and **The Adventures of Cock Robin and His Mate**, both by **Cherry and Richard Kearton**. These two volumes have been issued from the House of Cassel, each contains over 200 pages, and is sold at 6/-. With the reputation of these authors it is not necessary to do more than draw attention to these well illustrated volumes.

Handbook of the Larger British Fungi, by **J. R. Ramsbottom**. British Museum (Nat. Hist.) London, 222 pp., 7/6. It is a pleasure to find a Handbook issued by our National Museum in a cover which is worthy, and certainly even at a slightly greater cost we consider it a great advantage to have volumes of this character suitably bound. The present book is based on the Guide to Sowerby's models of British Fungi in the Department of Botany, British Museum (Natural History), by W. C. Smith, and contains over 140 figures in the text, all of which are admirable. The introduction is an excellent account of the Fungi generally, and one which can be specially recommended to every botanist, and particularly to those interested in the Fungi.

SKIPWITH INSECTS.

CHRIS. A. CHEETHAM.

THE following notes were made at Skipwith Common on the Monday following the Entomological Excursion of June 23rd, the writer was unable to get there on the Saturday, and hearing Dr. Fordham was similarly placed agreed to have an afternoon with him on the 25th. The lack of sunshine and much wet on the vegetation from the heavy rain of the previous night account for the very poor results here tabulated.

DIPTERA :—

- Ochlerotatus nemorosus* Mg. (Culex) this was a most persistent and vicious biter.
Culicella morsitans Theob. (Culex).
Limnophila ferruginea Mg.
L. meigenii Verr.
 **Prionocera turcica* (Tipula Diana).
Pachyrrhina crocata L.
Chrysopilus cristatus Verr.
Lasiopogon cinctus F. The only other county record for this is Dr. Fordham's Allerthorpe Common.
Thereva nobilitata F.
Leptis scolopacea L.
Argyra leucocephala Mg.
Paragus tibialis Flin.
Chrysogaster hirtella Lw.
C. macquarti Lw.
Platychirus peltatus Mg.
P. manicatus Mg.
Syrphus albostrigatus Flin.
S. tricoloratus Flin.
S. venustus Mg.
S. lunulatus Mg.
S. cinctellus Ztt.
S. compositarum Verr.
Sphaerophoria menthastri L.
Xylota segis L.
Chrysotoxum arcuatum L.
Leucozona lucorum L.
Volucella pellucens L.
V. bombylans L.
 The only dragonfly seen was *Agrion puella*.

Dr. Fordham reports :—

COLEOPTERA.—A dead rabbit produced a few *Silpha sinuata* F., together with *Necrophorus mortuorum* F. and other commoner species. *Lochmæa suturalis* Th. was abundant on heather, and its var. *nigrita* Weise. very frequent, together with an undetermined species of *Haltica*. On herbage *Malachius bipustulatus* L. was rather more frequent than usual.

HEMIPTERA.—The only bugs of any note taken were single specimens of *Piezodorus lituratus* F. and *Zicrona cærulea* L.

HYMENOPTERA.—Owing to the very small amount of sunshine, Aculeates were scarce, the only species taken were one each of a *Pemphredon*, a small *Crabro*, and a *Halictus*. Numerous pupae of *Colletes daviesana* were, however, obtained in a colony of several years standing in a sandy pit. A large number of ichneumon flies, as yet unidentified was taken, and among the sandflies, *Thentredella atra*, *Atlantis arcuatus*, *Rhogogaster viridis* and *Selandria stramineipes* (the latter very abundant on bracken) may be mentioned.

* This is an addition to the County List.

THE MITES OF YORKSHIRE.

WM. FALCONER, F.E.S.

(Continued from page 218).

Eriophyes spec.

V.C. 65.—On leaves of dog's mercury, a portion of the tip elevated into a convex blister, with a corresponding cavity below, Mill Gill Force, Wensleydale.

E. tilia Pgnst.

V.C. 63.—Bottom of Storthes Hall Lane, Kirkburton, S. L. M.

V.C. 64.—Shipley Glen, W. P. W., on *Tilia vulgaris*.

E. tilia Pgnst. var. *liosoma* Nal.

V.C. 62.—Both forms Houard 4146 and 4158, N. Yorkshire, R. S. B., J. W. H.

V.C. 65.—On broad-leaved limes, Billy Banks Wood, Richmond.

E. tiliarius Con.

V.C. 63.—On bract edges of *Tilia europæa*, Cannon Hall.

E. macrochelus Nal.

On sycamore.

V.C. 63.—Widespread in the Huddersfield district.

V.C. 65.—Newbiggin (Bishopdale), W. P. W.; Coverham and Jervaulx.

E. macrorrhyncus Nal.

V.C. 62.—On sycamore, Hackness, R. M. B., ; Ellerburn, H. J. B.
On maple, Pickering, H. J. B.

V.C. 63.—Marley, Mr. Morrell, on sycamore; Healey House and Beaumont Park, Huddersfield, on sycamore. Cawthorn, on maple, abundant on one hedge.

V.C. 65.—Newbiggin (Bishopdale), W. P. W.

E. spec.

Houard 3976 or 3977.

V.C. 62.—Hayburn Wyke, H. J. B., on sycamore.

E. empetri Lindr.

V.C. 62.—On crowberry, common in N. Yorkshire, R. S. B., J. W. H.

E. fraxinivora Nal.

V.C. 65.—On an ash between Jervaulx and Masham.

E. thomasi Nal.

V.C. 62.—On wild thyme, Hackness, plentiful, J. M. B.

E. euphrasiæ Nal.

V.C. 62.—On eyebright, N. Yorkshire, local, R. S. B., J. W. H.

E. spec.

V.C. 62.—On foxglove, *The Naturalist*, October, 1913, pp. 353-4, 'looked for since, but unseccessfully,' Hackness, H. J. B.

E. spec. Houard 5036.

V.C. 63.—On *Linaria vulgaris*, Fenay Bridge, Bradley, Kirkheaton railway tip and Mirfield.

E. galii Karp.

V.C. 61.—River bank above Selby, on goosegrass.

V.C. 62.—Scalla Moor, Ravenscar and Beast Cliff, on goosegrass, H. J. B.

V.C. 63.—Wilberlee, Barrett Clough and Drop Clough, on *G. saxatile*. Cawthorn, on *G. verum*.

V.C. 64.—King Wood Lane, Adel, on *G. saxatile*. Thorner to Collingham, on *G. verum*. Stubbing Moor, Wothersome, and Lendrick Hill, on Bramham road, on goosegrass.

E. destructor Nal.

V.C. 62.—On *Sedum acre*, N. Yorkshire, R. S. B., J. W. H.

Eriophyes geranii Can.

V.C. 62.—On *G. sanguineum*, Hawnby (1906 and 1917) and Sutton Bank, near Gormire, E. of Thirsk (1917), well established in both localities.

E. pilosellæ Nal.

V.C. 62.—On *H. pilosella*, Trout Dale (1904) and Shaken Bridge, between Helmsley and Hawnby (1906), one plant in each place, H. J. B.

V.C. 63.—Wilberlee, Kirkheaton and Banks Wood, Emley.

E. tuberculatus Nal.

V.C. 63.—On tansy, Bradley to Mirfield, on the canal bank.

E. alpestris Nal.

V.C. 62.—On *Rhododendron ferrugineum*, Linthorpe, near Middlesbrough, R. S. B.

Phyllocoptes epiphyllus Nal. Houard 4646, on ash.

V.C. 63.—Barrett Clough and Wilberlee (Slaithwaite), Ravensknowle (Huddersfield), Coxley Valley, Deffer Wood and Cannon Hall.

V.C. 64.—Roundhay Park (Leeds) and Adel.

P. gymnaspiis Nal. Houard 3972 and 4015.

V.C. 63.—Fleming House Lane (Huddersfield), on maple. Thunder Bridge, on sycamore.

V.C. 64.—Roundhay Park, on both plants.

P. acericola Nal.

An erineum on the leaves of sycamore and maple. Some confusion seems to exist in Houard, and the records have become somewhat mixed. In *P. acericola* proper the abnormal hairs are gradually enlarged and situated in the vein angles, and in the discarded variation *erinea* of *E. macrochelus*, they are irregularly 'mushroomed' on the blade. They are here set down under the same name for further investigation.

V.C. 62.—Staintondale, sycamore.

V.C. 63.—Thunder Bridge, gradually enlarged, on sycamore; Cawthorn, 'mushroomed' on maple.

V.C. 64.—Roundhay Park, on sycamore.

V.C. 65.—Wensleydale from Hawes to Jervaulx, and in Swaledale, abundant on sycamore.

Epitrimerus trilobus Nal.

On elder.

V.C. 62.—Scarborough, J. M. B.

V.C. 63.—Fixby and Woodsome Lees, Huddersfield.

V.C. 64.—Gorge, Roundhay Park.

In addition, 'pear leaf blight' has been assigned to *E. pyri* Pgnst., Fixby, Huddersfield, S. L. M., V.C. 63; and 'plum leaf blight' to *E. phlæocoptes* Nal., Thornton Dale, F. A. M., V.C. 62.

Fam. DEMODICIDÆ.

Demodex folliculorum Linn.

In follicles of the hair, widespread and of common occurrence.

II.—SUB-ORDER—ASTIGMATA.

Fam. SARCOPTIDÆ.

Sub-fam. SARCOPTINÆ.

Sarcoptes scabiei Linn.

Very frequent in every practitioner's experience, and, as in the last, a list of localities would be too long and serve no useful purpose.

Sub-fam. TYROGLYPHINÆ.

Hericia robini Can.

V.C. 62.—Great Ayton, feeding on the sap of the ash, W. P. W.

Tyroglyphus siro Linn. (the cheese mite).

V.C. 63.—Huddersfield, S. L. M. ; Shipley, W. P. W. ; Leeds.

T. entomophagus Lab.

V.C. 63.—Huddersfield, S. L. M.

Glyciphagus spinipes Mich.

V.C. 63.—Slaithwaite and Linthwaite, barns and stables in hay refuse ; Lockwood, in a paper box, in all abundant.

V.C. 64.—Ben Rhydding, in a blue tit's nest, H. B.B., *The Naturalist*, December, 1915, p. 398.

G. domesticus Degeer.

V.C. 63.—With the last about Slaithwaite and Linthwaite, and just as plentiful.

Histiostoma rostro-serratum Megnin.

V.C. 63.—Huddersfield museum in Allinson's whole wheat meal and Lockwood, S. L. M. ; Clayton West, in quantity in damaged potatoes.

H. muscarum Schrnk.

V.C. 64.—Numerous hypopi on a fly's head and body, Old Farnley, Leeds, C. A. Cheetham, new to Britain.

Aleurobius farinosus Koch.

V.C. 64.—Ben Rhydding, nest of blue tit, H. B. B., *The Naturalist*, 1915, December, p. 398.

III.—SUB-ORDER—METASTIGMATA.

Fam. ORIBATIDÆ.

Liacarus ovatus Koch.

V.C. 62.—Lonsdale, moss, J. E. H.

V.C. 63.—Ainley Place, Slaithwaite, moss, 2 examples.

V.C. 64.—Adel Bog, moss.

L. bicornis P. and W.

V.C. 64.—Austwick Bog, P. and W., *Proc. Zoo. Soc.*, 1905. Other localities : Cambridgeshire, Cumberland and Westmorland.

Tegeocranus latus Koch.

V.C. 62.—Eston, J. E. H.

V.C. 63.—Ainley Place and Bottoms Wood, Slaithwaite ; Deffer Wood, Cawthorn, all in rotting wood.

T. cepheiformis Nic.

V.C. 62.—Lonsdale, in a swamp, a local species, J. E. H.

Tectocephus velatus Mich.

V.C. 62.—Lonsdale, amongst pine needles, J. E. H.

V.C. 64.—Ben Rhydding, H. B. B., in the nest of a coal tit, *The Naturalist*, December, 1915, p. 398.

Odontocephus elongatus Mich.

V.C. 62.—Lonsdale, J. E. H.

V.C. 63 or 64.—Also from West Riding (J. E. H.).

Carabodes labyrinthica Mich.

V.C. 62.—Lonsdale, lichen on a wall, J. E. H.

V.C. 63.—St. Ives Wood and Ruin Bank Wood, Bingley, moss and lichens, W. P. W.

C. marginatus Mich.

V.C. 62.—Great Ayton, lichen on a fence, and Lonsdale, lichen on a wall, J. E. H. ; Farndale, J. W. H.

V.C. 63.—Ruin Bank Wood, Bingley, W. P. W.

C. nepos Hull.

V.C. 63.—St. Ives Wood, Bingley, moss, W. P. W., July, 1914.

C. scymnus Hull.

'Many localities in Yorkshire.'—British Oribatidæ, *The Naturalist*, September, 1914, description and figures, pp. 282-3, in lichen and dead wood. The only ones known to me are—

- V.C. 63.—St. Ives Wood and Ruin Bank Wood, Bingley, moss and lichens, Chellow Dene, Bradford, in an old nest, W. P. W.; Blind Lane, Shipley, F. R.
- Pelops farinosus* Nic.
Rare east of the Pennines.
- V.C. 63.—Ainley Place Bottoms, Slaithwaite, moss, November, 1914.
- P. fuliginus* Koch.
V.C. 61.—Eston (nymph), J. W. H., sub. *P. lævigatus* Nic., February, 1914.
- Sphærozetes orbicularis* Koch.—Hull.
V.C. 65.—Hawes, J. S.
- S. piriiformis* Nic.
V.C. 63.—Holme Moss, in sphagnum, several examples, May, 1919.
- S. picipes* Koch.
V.C. 62.—Lonsdale, J. E. H.
V.C. 63.—Clowes Moor, Marsden, in sphagnum.
- S. notatus* Thor.
V.C. 63.—Between Bingley and Cottingley, dead leaves, and near Shipley Cemetery, under stones, W. P. W.
- S. fuscipes* Koch.
V.C. 63.—Hurst Wood, Shipley, W. P. W.; plentiful amongst sphagnum, Dean Head, below the church, Drop Clough, the Scout and Wessenden Valley (Marsden), and Barrett Clough (Slaithwaite)
- Achipteria ovalis* Koch.
V.C. 65.—Hawes, J. S.
- A. quadricornuta* Mich.
V.C. 62.—Eston, on dead wood, J. E. H.
- Ceratozetes gracilis* Mich.
V.C. 63.—Clowes Moor, Marsden, sphagnum, many examples.
- Euzetes globulus* Nic.
V.C. 61.—Brantingham Dale, Houghton Woods and Hornsea, T. S.
V.C. 62.—Eston, dead wood and moss, J. E. H.; Ingleby Greenhow, J. W. H.
- V.C. 63.—Cottingley Park and Hurst Wood (Shipley), W. P. W.; Hebden Bridge and Crimsworth Dene; a common and generally distributed mite in the Huddersfield district.
- V.C. 64.—Howden Wood (Sconce), W. P. W.; Sawley, S. M.; Bolton Woods, Adel Bog.
- V.C. 65.—Grinton and wood between Downholme Bridge and Marrick Priory.
- Trichoribates edwardsii* Nic.
V.C. 62.—Eston and Lonsdale, moss, J. E. H.
- V.C. 63.—St. Ives Wood, Bingley and Hurst Wood, Shipley, W. P. W.
An abundant species amongst moss in the Huddersfield district;
- V.C. 65.—Thornton in Lonsdale, old grass heap.
- Oribates obivus* Berl.
V.C. 63.—Sun Dean, Huddersfield, many examples beneath embedded stones.
- O. elimatus* Koch.
V.C. 63.—Further Hurst Wood, Shipley, W. P. W.
V.C. 64.—Trench Wood, Shipley, W. P. W.
- Chamobates cuspidatus* Mich.
V.C. 62.—Great Ayton, lichen on a fence, and Lonsdale, in a swamp, J. E. H.
- V.C. 64.—Ben Rhydding, in a coal tit's nest, H. B. B., *The Naturalist*, December, 1915, p. 398.
- Zetomimus boothianus* Hull.
V.C. 64.—Ben Rhydding, a unique example, in a coal tit's nest, H. B. B., description and figure, *The Naturalist*, December, 1915, p. 399.

Ze'omimus furcatus P. and W.

V.C. 64.—Austwick Bog, *Proc. Zoo. Soc., London*, 1905. It has now occurred in Cumberland, Westmorland and the Tyne Provinces.

Oribatula exilis Nic.

V.C. 65.—Hawes, J. S.

O. tibialis Nic.

Michael in 'British Oribatidæ' states it to be general.

V.C. 63.—Hurst Wood, Shipley, amongst grass and dead leaves, Marsh Cote (Harden), W. P. W.

O. affinis Hull.

V.C. 63.—Chellow Dene, Bradford, in an old bird's nest, W. P. W.

O. michaelii Hull.

V.C. 62.—Cleveland, J. W. H.

V.C. 63.—St. Ives Woods, Bingley, Moss, W. P. W.

O. similis Mich.

V.C. 63.—Cottingley, W. P. W. An abundant and widely spread species amongst grass and moss and beneath stones in the Huddersfield district.

V.C. 64.—Adel Bog.

O. anomala Hull.

V.C. 63.—Hurst Wood, Shipley, among grass and dead leaves, W. P. W.

Ceratoppia bipilis Herm.

V.C. 61.—Houghton Woods, T. S.

V.C. 62.—Cleveland and Farndale, J. W. H.

V.C. 63.—Bradford, Hurst Wood (Shipley), and St. Ives Woods (Bingley), W. P. W.; Deffer Wood, (Cawthorn), Hebden Bridge and Crimsworth Dene; an abundant and generally distributed mite in the Huddersfield district.

V.C. 64.—Howden, Trench Wood (Shipley), W. P. W.; Bolton Woods, Adel Bog; Roundhay Park gorge, Leeds, amongst moss on a damp bank, April, 1919.

Notaspis lucorum Koch.

V.C. 62.—Cleveland, J. W. H., mycophilus.

N. oblonga Koch.

V.C. 62.—Lonsdale, lichen on a wall, J. E. H.

V.C. 65.—Hawes, J. S.

Hydrozetes lacustris Mich.

V.C. 62.—Cayton Bay pond, abundant, R. A. T.

Caleremæus monilipes Mich.

V.C. 63 or 64.—In material sent from near Leeds, B.O.

Damæosoma denticulatum G. and R. C.

V.C. 63.—Marsh Cote, near Harden, in old haystack, July, 1918, W. P. W.

V.C. 64.—Ben Rhydding, in a coal tit's nest, H. B. B. *The Naturalist*, December, 1915, p. 398.

Autogneta lanceolata Mich.

V.C. 62.—Cleveland, J. W. H.

A. pectinata Mich.

Recorded for 'Yorkshire' in *T.A.T.P.*; been unable to get any more definite locality.

Disorhina splendens Koch.

V.C. 62.—Lonsdale, in a swamp, J. E. H.

Amolops clavipectinatus Mich.

V.C. 64.—Ben Rhydding, in a coal-tit's nest, H. B. B. *The Naturalist*, December, 1915, p. 398.

Damæus riparius Nic. (*D. auritus* B. O.).

V.C. 62.—Lonsdale, amongst pine needles, J. E. H.

D. clavipes Herm.

V.C. 61.—Cottingham, King's Mill Marsh (Drifffield), and Houghton Woods, T. S.

V.C. 62.—Lonsdale, in a swamp and moss, J. E. H.; Farndale, J. W. H.; Ringingkeld Bog (Cloughton), R. A. T.

V.C. 63.—Hollin Wood and Hesp Hills, Bingley; Cottingley and Cottingley Woods; and Hurst Wood (Shipley), W. P. W.; Blind Lane, Shipley, F. R.; Hebden Bridge and Crimsworth Dene; Askern; common and widely distributed in the Huddersfield district.

V.C. 64.—Trench Wood, Shipley, W. P. W.; Austwick, C. A. Cheetham; Trow Gill, Ingleborough, Valley of Desolation (Bolton Woods); Knaresborough; Adel Moor and Rigton Bank, near Leeds.

Damæus geniculatus Linn.

V.C. 61.—Brantingham Dale, Weedley, Houghton Woods, Skidby chalk pits, T. S.

V.C. 62.—Eston, J. E. H.; Staintondale, W. P. W.; Farndale, J. W. H.; Ringingkeld Bog, Cloughton, R. A. T.

V.C. 63.—Saltaire, Cottingley Bridge, Harden, Chellow Dene, in old bird's nest, W. P. W.; Fenay Bridge, Huddersfield.

V.C. 64.—Posforth Gill, Bolton Woods; Knaresborough.

Hermannia convexa Koch.

V.C. 62.—Eston, in moss, Lonsdale, in a swamp, J. E. H.

V.C. 65.—Hawes, J. S.

H. scabra L. Koch.

V.C. 63.—Ainley Place Bottoms, Slaithwaite, in rotting wood, several examples.

H. nana Mich.

V.C. 63.—Shipley, W. P. W.; Wilberlee, Slaithwaite, 2 examples, amongst hay refuse in a barn.

Heminothrus bistriatus Koch.

V.C. 62.—Lonsdale, in a swamp, J. E. H.

V.C. 63.—Further Hurst Wood, and Hurst Wood, Shipley, Hesp Hills, Bingley, W. P. W.; plentiful amongst sphagnum, Royal Clough and below Dean Head Church (Scammonden); Barrett Clough and Ainley Place (Slaithwaite); Clowes Moor (Marsden); Holme Moss.

V.C. 64.—Adel Bog.

Angelia silvestris Nic.

V.C. 62.—Lonsdale, moss, J. E. H.

V.C. 63.—St. Ives Woods, Bingley, moss, W. P. W.

A. palustris Koch.

V.C. 62.—Lonsdale, in a swamp, J. E. H.

Nothrus spinifer Koch.

V.C. 62.—Lonsdale, in a swamp, and amongst pine needles and moss under conifers, J. E. H.

N. horridus Herm.

V.C. 62.—Lonsdale, in a swamp, J. E. H.

N. bicarinatus Koch.

V.C. 62.—Lonsdale, from spruce, J. E. H.

N. segnis Herm.

N. requis in *The Naturalist*, March, 1914, p. 87, a caligraphic error for this species. Yorkshire Hills, P. and W.

V.C. 62.—Lonsdale, pine needles and moss under conifers, J. E. H.

Hypochthonius rufulus Koch.

V.C. 63.—Hurst Wood, Shipley, sphagnum and Polytrichum, W. P. W.; Barrett Clough, Ainley Place bottoms in *Hypnum*, and Wilberlee (Slaithwaite), under a small heap of grass in a garden; Sun Dean, under embedded stones.

V.C. 64.—Adel Bog, Leeds.

Haploderma magnum Nic.

V.C. 62.—Lonsdale, pine needles and moss under conifers, J. E. H.

V.C. 63.—Lepton Great Wood and Carr Wood, Huddersfield, amongst moss.

Haploderma dasyopus Dug.

V.C. 62.—Eston, dead wood, Lonsdale, swamp; pine needles and moss, J. E. H. ; Ingleby Greenhow, J. W. H.

V.C. 63.—St. Ives Woods, Bingley, W. P. W. ; Drop Clough, Marsden, amongst fallen leaves.

V.C. 64.—Thornton-in-Lonsdale ; Adel Bog.

H. affine Hull.

Other localities, Cheshire, Cumberland and Tyne provinces.

V.C. 64.—Adel Bog, several examples.

Phthiracarus arduus Koch.

V.C. 63.—Above Whet Ings, Hebden Bridge ; Bottoms Wood (Slaithwaite), beneath an embedded stone in a damp place.

Fam. LABIDOSTOMMATIDÆ.

Lapidostomma luteum Kr.

Dr. George, *The Naturalist*, June, 1912, pp. 183-4.

V.C. 63.—Hurst Wood, Shipley, W. P. W. ; Butternab Wood ; Sun Dean, numerous examples, beneath the covering stones of *Donisthorpea nigra*.

V.C. 64.—Howden, W. P. W. ; Adel Moor, Leeds, in a similar habitat.

Fam. IXODIIDÆ.

Ixodes reduvius Linn.

V.C. 63.—Wilberlee, Slaithwaite, 2♀s, on a cow imported from Wales.

I. putus Camb.

Yorkshire, Nuttall and Warburton's Monograph. Bempton and Buckton, 1906, E. G. Wheeler ; Bempton, 1908, O. Grabham. A parasite on sea birds (guillemots, razorbills, puffins, herring gulls, kittiwakes).

I. hexagonus.

V.C. 64.—One example on a cat, Selby, Mr. Cheeseman.

Fam. GAMASIDÆ.

Sub-fam. UROPODINÆ.

Cillibano catula Hull.

T.A.T.P., plate I., figs. 12 and 13, and p. 44.

V.C. 63.—Ainley Place and Wholestone Moor, one example at each place.

C. cassidea Herm.

V.C. 63.—Barrett, Slaithwaite, in a barn.

Glyphopsis formicariæ Lubb.

V.C. 64.—Ingleton, in the nest of *Lasius flavus*, one ♀.

Trachyuropoda coccinea Mich.

In ant's nests.

V.C. 63.—Drop Clough and Sun Dean, numerous ; Chew Valley (Greenfield) ; Pike Lowe (Holmfirth), numerous ; Norland Moor (Halifax).

V.C. 64.—Adel Moor, plentiful.

Uridiaspis tecta Kr.

T.A.T.P., plate I., figs. 17 and 18.

V.C. 63.—Chellow Dene, Bradford, in an old bird's nest, W. P. W.

V.C. 64.—Adel Bog.

Urodinychus krameri Can.

Probably common in the county.

V.C. 63.—Blind Lane, Shipley, F. R. ; Slaithwaite and Linthwaite, swarms in barns and stables amongst hay refuse ; Ainley Place bottoms, a few amongst *Mnium* ; Slaithwaite and Huddersfield, pedunculate nymphs on the legs of flies.

- V.C. 64.—Ben Rhydding, in a coal tit's nest, H. B. B., *The Naturalist*, December, 1915, p. 398.
Urodinychus janetii Berl.
 V.C. 62.—Cleveland, from nests of *Formica rufa*, J. W. H.
Liodinychus winteri Hull.
The Vasculum, February, 1921, p. 19.
 V.C. 63.—Marsh Cote, Harden, haystack refuse.
Urobovella notabilis Berl.
 Ireland is the only other station given in the *T.A.T.P.*
 V.C. 63.—Drop Clough (Marsden), ♂ and ♀♀s with nymph, the last new to science ; nests of black ant.
Dinychus tetraphyllus Berl.
 V.C. 63.—Barrett Clough (Slaithwaite), in dead wood, one example.
Epicrotus geometricus C. and F. Can.
 V.C. 63.—Drop Clough (Marsden), one example in sphagnum, June, 1920.
- Sub-fam. LAELAPTINÆ.
- Hæmolaelaps stabularis* Koch.
 V.C. 63.—Clowes Moor (Marsden), Slaithwaite and Linthwaite, abundant in barns and stables amongst hay refuse ; Ainley Place bottoms, amongst ground moss.
 V.C. 64.—Trench Wood, Shipley, W. P. W.
 V.C. 65.—Grinton (Swaledale), numerous.
Laelaps echidninus Berl.
 V.C. 63.—Bradford, from flour, F. R. ; Dean Head (Scammonden), one ♂ ; Ainley Place bottoms from moss.
L. agilis Koch.
 V.C. 63.—Near Huddersfield, on a water vole, S. L. M., two examples.
Episeius italicus Berl.
 V.C. 63.—Beaumont Park, Huddersfield, two examples from vegetable debris.
Ameroseius hirsutus Koch.
 V.C. 63.—Shipley, W. P. W.
Laseioseius levis O. and W.
 The only other locality in Hull's *T.A.T.P.* is Ireland.
 V.C. 63.—Barrett Clough, amongst sphagnum, one example, October, 1919.
L. muricatus Koch.
 V.C. 63.—Cottingley, W. P. W.
Euiphis ostrinus Koch.
 V.C. 63.—Chellow Dene, in an old bird's nest, W. P. W. ; Ainley Place bottoms, Dean Head, Wholestone Moor, and Wilberlee (Slaithwaite) ; Clowes Moor and Standedge (Marsden) ; Whitley Woods, Sun Dean and Holme Moss, amongst grasses and moss.
E. pterophilus Berl.
 V.C. 63.—Dean Head, Scammonden, one example.
Ololaelaps inornatus Johnst. (*O. confinis* Berl.).
 V.C. 63.—Hurst Wood (Shipley), amongst *Polytrichum*, W. P. W. ; Clowes Moor (Marsden) and Dean Head (Scammonden), ♀s, amongst sphagnum.
O. placentula Berl.
 V.C. 63.—Dean Head and Royal Clough, Scammonden ; Clough House Wood (Slaithwaite), on a tree stump ; Hey Wood (Honley), amongst ground moss ; Lepton Great Wood, amongst dead leaves.
Hypoaspis oblongus Halb.
 V.C. 63.—Wilberlee, Ainley Place, and Far Wortshill (Slaithwaite), in barns, plentiful.
 V.C. 65.—Riverside by Grinton Bridge (Swaledale), in cast-out stable refuse.

Hypoaspis nitidissimus Hull.

T.A.T.P., plate II., fig. 43 and p. 67.

V.C. 63.—Wilberlee, Barrett and Wortshill, in barns, plentiful; Clough House Wood.

V.C. 65.—With the last by Grinton Bridge.

H. aculeifer Can.

V.C. 61.—Cottingham and Hessle, T. S.

V.C. 63.—Bradford, W. P. W.; Ainley Place and Barrett Clough (Slaithwaite); Royal Clough (Scammonden), Hey Wood (Honley), Deffer Wood (Cawthorn).

V.C. 64.—Ingleborough.

Cosmolaelaps vacuus Mich.

This and the next with the black ant.

V.C. 63.—Horn Hill, near Holmfirth.

Oolaelaps oophilus Wasm.

V.C. 63.—Sun Dean and Horn Hill.

Macrocheles marginalis Herm.

V.C. 63.—Cullingworth, Chellow Dene (in an old bird nest) and Hurst Wood (Shipley), W. P. W.; several localities about Marsden and Slaithwaite; Carr Wood (Woodsome); Whitley Woods; Holme Moss. Amongst sphagnum and other mosses, and beneath grass heaps, common.

V.C. 64.—Roundhay Park gorge, Leeds.

M. plumipes Hull.

T.A.T.P., plate II., fig. 28 and p. 72.

V.C. 63.—Ainley Place (Slaithwaite), amongst damp moss.

M. cognatus Falcr.

Described and figured in *The Naturalist*, April, 1923, p. 152.

V.C. 63.—Several localities about Slaithwaite, in similar situations to *M. marginalis*.

Nothrolaelaps tridentinus Can.

V.C. 61.—Cottingham, T. S.

V.C. 63.—Marsh Cote (Harden) in an old haystack, W. P. W.; below Dean Head Church, Scammonden.

V.C. 64.—Settle, two females by the river; Scarcroft Hill, on a manure heap.

N. hullii Falcr.

Described and figured in *The Naturalist*, April, 1923, pp. 152-3.

V.C. 63.—Winterset Reservoir, Wakefield, amongst vegetable debris.

Geholaspis longispinosus Kr.

V.C. 63.—Chellow Dene, Bradford, in an old bird nest, W. P. W.; Dean Head, Scammonden, and Wessenden Valley, Marsden, in sphagnum.

Dissoloncha superba Hull.

T.A.T.P., plate II., figs. 23-24 and p. 71.

V.C. 61.—Welwick, on the shore, one female, T. S.

Coprrholaspis glaber Mull.

T.A.T.P., plate II., fig. 29 and pp. 72-3.

V.C. 63.—Bankfield Drive, Shipley, W. P. W.; Slaithwaite district, abundant in manure and on the under surface of dung beetles (*Geotrupes*).

There are two other species of *Macrocheles* Latr. (aggreg.) in the county as yet undescribed:—

1. V.C. 64.—Roundhay Park gorge, Leeds, from moss on a damp bank bordering the pathway.

2. V.C. 63.—Gawthorpe, Huddersfield, from wet moss on a stone water trough, two examples.

Cyrtolaelaps herculaneus Berl.

V.C. 63.—Hurst Wood, Shipley, dead leaves, W. P. W.; Drop Clough and Clowes Moor, Marsden; Royal Clough, Scammonden;

Joy Wood, Storthes Hall; Whitley Woods, all from vegetable debris.

Cyrtolaelaps nemorensis Koch.

V.C. 61.—Hornsea Mere, Houghton Woods, and Brantingham Dale, T. S.

V.C. 63.—Hebden Bridge and Crimsworth Dene; a common and widely distributed mite in the Huddersfield area amongst grass, dead leaves and moss.

V.C. 64.—Trench Wood, Shipley, W. P. W.; Newby Cote and Ingleton; Linton Common.

C. kochii Trag.

V.C. 63.—Royal Clough (Scammonden); Ainley Place; Wessenden Valley, Clowes Moor, Standedge and Drop Clough (Marsden); Chew Valley (Greenfield); Holme Moss; Butternab Wood and Carr Wood (Huddersfield); Askern.

V.C. 64.—Austwick, C. A. Cheetham; Kingsdale Beck, Ingleton.

C. transisalæ Oud.

V.C. 63.—Hollins Wood, Bingley and Hurst Wood, Shipley, from Polytrichum and sphagnum, W. P. W.; Barrett Clough, Ainley Place and Wilberlee (Slaithwaite); Wessenden Valley and Clowes Moor (Marsden), sphagnum.

C. cervus Kr.

Gamasus ignotus Geo., *The Naturalist*, March, 1913, pp. 139-140; July, 1913, p. 260, wrongly assigned to Yorkshire.

V.C. 63.—Hurst Wood, Shipley, W. P. W.; several localities about Slaithwaite; Clowes Moor and Wessenden Valley (Marsden); Chew Valley (Greenfield); Fenay Bridge and Lepton Great Wood; Hebden Bridge.

V.C. 64.—Near Gaping Ghyll Hole, Clapham.

Hæmogamasus nidi Mich.

V.C. 63.—Wilberlee, on a dead field mouse in a tub, one example.

H. hirsutus Berl.

V.C. 61.—Sunk Island, T. S., one example.

V.C. 63.—Below Dean Head Church, 1♀, no connection with a mole noticed.

Gamasellus rubicundus Hull.

V.C. 63.—Holme Moss, under a dead grouse, one ♀.

Ologamasus calcaratus Koch.

V.C. 61.—Brantingham Dale, T. S.

O. pollicipatus Berl.

V.C. 63.—Blind Lane, Shipley, F. R.; Hesp Hills, Bingley, Royds Cliff Wood, Hurst Wood, Shipley, 1♂, W. P. W.; Clough House Wood, and Wilberlee, grass, sphagnum, dead leaves and in a barn; Lepton Great Wood, needles of Austrian pine.

V.C. 64.—Trench Wood, Shipley, W. P. W.

Var. *pseudoperforatus* Berl.

V.C. 63.—Whet Ings, Crimsworth Dene; Hurst Wood and Cottingley, W. P. W.

Pergamasus crassipes Linn.

Common everywhere; numerous records for all the vice counties.

Var. *longicornis* Berl.

V.C. 63.—Dean Head, Scammonden, ♂s, said to be common in the North of England, and distinguished from the type by the elongate patellar spur, legs. 11.

P. alpestris Berl.

V.C. 63.—Ainley Place bottoms, Barrett Clough, Wilberlee (Slaithwaite), in moss, dead leaves, and beneath a stone; Lepton Great Wood, from fallen Austrian pine needles.

V.C. 64.—Sawley, Ripon.

Pergamasus coniger Hull.

T.A.T.P., plate II., figs. 38 to 40.

V.C. 63.—A few localities about Slaithwaite, but perhaps the same as the last species.

P. robustus Oud.

V.C. 63.—Chellow Dene, Bradford, Cottingley, and Hurst Wood, Shipley, W. P. W.; a very common and widely distributed mite in the Huddersfield district; Chew Valley, Greenfield; Hebden Bridge; ground moss, sphagnum, fallen leaves.

V.C. 64.—Thornton in Lonsdale; Roundhay Park gorge, Leeds.

P. runciger Berl.

V.C. 61.—West Wood, Beverley, W. P. W.

V.C. 63.—Hurst Wood, Shipley and Cottingley, W. P. M.; Huddersfield district, another very common and widely distributed mite.

V.C. 64.—Sawley High Moor (Ripon); Bolton Woods; Roundhay Park Gorge, Leeds.

P. runcatellus Berl.

V.C. 63.—Chellow Dene, Bradford, in an old bird nest, W. P. W.; Ainley Place Bottoms, Clough House Wood and Wilberlee (Slaithwaite), both sexes.

P. hamatus Koch.

V.C. 61.—Hornsea Mere, T. S.

V.C. 63.—Bradford, W. P. W.; Ainley Place bottoms and Barrett Clough (Slaithwaite); Dean Head and Royal Clough (Scammonden); Clowes Moor (Marsden); Hey Wood and Honley Old Wood; Denby Dale; Hebden Bridge and Crimsworth Dene.

V.C. 64.—Ingleborough.

P. septentrionalis Oud.

V.C. 63.—Chellow Dene (Bradford), and Hurst Wood (Shipley), W. P. W.; Ainley Place and Clough House (Slaithwaite); Drop Clough (Marsden).

V.C. 64.—Trench Wood (Shipley), W. P. W.; Wothersome.

Gamasus kempersii Oud.

V.C. 63.—Wilberlee (Slaithwaite), one female in a barn, a very unusual habitat.

G. lunaris Berl.

V.C. 63.—Marsh Cote, Harden, W. P. W.; Slaithwaite, plentiful in manure heaps as nymphs; Kirkheaton, amongst thrown out stable refuse.

V.C. 64.—Thornton in Lonsdale; Sawley.

G. fimetorum Berl.

V.C. 63.—Marsh Cote, Harden, and Bankfield Drive, Shipley, W. P. W.; Slaithwaite, in manure heaps.

V.C. 64.—Thornton in Lonsdale, and Settle, amongst cut grass.

G. coleopterorum Linn.

A very common species in manure and heaps of cut grass; nymphs plentiful on *Geotrupes* spp.—recorded for all the vice-counties.

G. anglicus Hull.

T.A.T.P., plate II., figs. 31 to 34, and pp. 83-4.

V.C. 61.—Brantingham Dale, April, 1916, ♂, T. S.; previously taken at Darwen, in Lancashire.

V.C. 63.—Cottingley, W. P. W.

G. magnus Kr.

V.C. 63.—Askern; Hill Top, Slaithwaite, in a green house.

G. cornutus Can.

V.C. 61.—West Wood, Beverley, W. P. W.

V.C. 63.—Wrenthorpe (Wakefield), J. W. H. Johnston; Shipley, W. P. W.; common and widely distributed in the Huddersfield district, moss, grass, fallen leaves, etc.

V.C. 64.—Settle; Valley of Desolation (Bolton Woods); Adel Moor and Bog.

Gamasus fucarius Hull.

G. fucorum Degeer, not now determinable.

T.A.T.P., plate III., figs. 35 to 37 and page 86.

V.C. 63.—Clough House Wood, Slaithwaite.

SUB-ORDER—HETEROSTIGMATA.

Fam. TARSONEMIDÆ.

Tarsonemus spirifex Mrchl.

V.C. 63.—Batley Carr, galling false oat grass.

T. woodii.

Said to be the cause of the dreaded Isle of Wight disease amongst hive bees—Aberdeen Laboratory of Parasitology—but this conclusion has since been questioned. The disease is apparently widespread in the county, and the following are definite records of it.

V.C. 61.—Beverley, W. P. W.

V.C. 63.—Keighley, R. B.; Shepley and Skelmanthorpe, B. Morley; Cawthorn, Mr. Charlesworth; Slaithwaite.

SUB-ORDER—PROSTIGMATA.

Fam. BDELLIDÆ.

Cyta latirostris Herm.

(?) *C. lutea* Geo., *The Naturalist*, August, 1912, pp. 236-7.

Recorded for Yorkshire in *T.A.T.P.*; been unable to obtain a more definite locality.

Bdella longirostris Herm.

B. hexophthalma Geo., *The Naturalist*, February, 1921, pp. 47-8.

V.C. 63.—Boggart Lane, Wilberlee, amongst humus and beneath damp stones.

V.C. 64.—Trench Wood, Shipley, W. P. W.

B. lignicola Can. (? *vulgaris* Herm.).

V.C. 63.—Saltaire to Bingley, loose moss, Further Hurst Wood, Shipley, W. P. W.; Ainley Place bottoms and Wilberlee, beneath stones on an earth-topped wall; Hall Heys Wood (South Crosland).

V.C. 64.—Austwick, C. A. Cheetham.

B. littoralis Linn.

V.C. 61.—Humber shore, near Hull, T. S.

B. pallipes L. Koch.

V.C. 63.—Fields about Wilberlee.

V.C. 64.—Thornton-in-Lonsdale; Linton Common.

V.C. 65.—Cogden Beck, Grinton (Swaledale).

Fam. HYDRACHNIDÆ.*

Sub-Fam. LIMNOCHARINÆ.

Limnochares aquatica Latr.

V.C. 63 and 64. C. D. S.

Sub-Fam. EYLAINÆ.

Eylais hamata Koen.

V.C. 64.—C. D. S.

E. infundibulifera Koen.

V.C. 61.—Barmston Drain, Hull, T. S., several examples.

E. discreta Koen.

V.C. 61.—Barmston Drain, Hull, T. S., several examples.

E. gigas Pier.

V.C. 63.—near Doncaster, one example, H. V. C.

E. triarcuata Pier.

V.C. 63.—near Doncaster, one example, H. V. C.

* See *ante*, p. 181.

Sub. Fam. HYDRYPHANTINÆ.

Hydryphantes ruber De Geer.

V.C. 62.—C. D. S.; Cayton Bay Pond, both sexes, R. A. T., abundant.

H. dispar Schaub.

V.C. 62.—C. D. S.

Thyas venustus Koch.

Yorkshire, locality not recorded, C. D. S.

Diplodontus despiciens Müll.

V.C. 62, and three other places, C. D. S.

Sub-Fam. HYGROBATINÆ.

Hygrobates longipalpis Herm.

V.C. 62.—C. D. S.; Cayton Bay Pond, ♂, and in a horse trough, Oliver's Mount.

H. naicus John.

V.C. 63.—C. D. S.

Megapus spinipes Koch.

Cromley Fell, 1895, from a bog pool, Mr. Scourfield—*Science Gossip*, New Series, August, 1899, p. 80, C. D. S.

Cochleophorus spinipes Müll.

V.C. 62.—Seamer Moor Pond, April, 1913, ♀, R. A. T.

C. vernalis Koch.

V.C. 62.—Seamer Moor Pond, September, 1912, ♂, R. A. T.

Teutonia primaria Koen.

V.C. 63.—C. D. S.

Frontipoda musculus Müll.

V.C. 62.—C. D. S.

Oxus strigatus Müll.

V.C. 62.—C. D. S.

Limnesia fulgida Koch.

V.C. 61, 62, 63, 64.—C. D. S.

L. maculata Müll.

V.C. 61.—C. D. S.; Barmston Drain and Houghton Woods, T. S.

V.C. 62, 63, 64.—C. D. S.

L. koenikei Pier.

V.C. 61, 62, 63, 64.—C. D. S.

Piona conglobata Koch.

V.C. 62.—C. D. S.; Seamer Moor Pond, ♀, R. A. T.

P. disparilis Koen.

V.C. 62.—C. D. S.

P. nodata Müll.

V.C. 62.—C. D. S.

V.C. 63.—Bradford, W. P. W.; near Doncaster, H. V. C.

P. fuscata Herm.

V.C. 62.—C. D. S.; Cayton Bay Pond, both sexes abundant, R. A. T.

P. rufa Koch.

V.C. 62.—C. D. S.

Acercus latipes Müll.

V.C. 62.—C. D. S.

A. lutescens Herm.

V.C. 62.—Cayton Bay Pond, ♂, R. A. T.

V.C. 63.—C. D. S.

Brachypoda versicolor Müll.

Common, C. D. S.

Arrenurus bifidicodulus Pier.

V.C. 62.—C. D. S.; Cayton Bay Pond, ♀, R. A. T.

A. caudatus Degeer.

V.C. 62.—C. D. S.; Cayton Bay Pond, ♀, R. A. T.

Arrenurus globator Müll.

V.C. 64.—C. D. S.

A. integrator Müll.

V.C. 62.—C. D. S.; Cayton Bay pond, ♂, R. A. T.

A. maculator Müll.

V.C. 62.—C. D. S.

A. ornatus George.

V.C. 61.—C. D. S.

A. sinuator Müll.

V.C. 62.—C. D. S.

Fam. THROMBIDIIDÆ.

Sub-Fam. RHAPHIGNATHINÆ.

Bryobia pretiosa Koch.

B. pratensis Geo. *The Naturalist*, January, 1915, p. 6.

V.C. 63.—Huddersfield district, a common and widely distributed mite, on tree trunks, beneath stones and on walls.

V.C. 64.—Giggleswick Scar, W. P. W.

V.C. 65.—Swaledale, general and plentiful.

Sub-Fam. EUPODINÆ.

Linopodes motatorius Linn.

V.C. 63.—Bradford district, well distributed, W. P. W.; an abundant and generally distributed mite beneath stones, etc., in damp places in the Huddersfield area; Crimsworth Dene and Hebden Bridge.

V.C. 64.—Ingleton district, common; Bolton Woods, common; Knaresborough.

V.C. 65.—Mill Gill, Askrigg, and Swaledale, general and plentiful.

Sub-Fam. CHEYLETINÆ.

Cheyletus eruditus Schr.

V.C. 63.—Slaithwaite, abundant amongst hay refuse in barns and stables.

V.C. 64.—Ben Rhydding, H. H. B., in nest of blue tit, *The Naturalist*, December, 1915, p. 398.

Sub-Fam. ERYTHRÆINÆ.

Anystis baccharum Linn.

The ubiquitous 'red spider,' tree trunks, walls and vegetation, numerous records for all the five vice-counties.

Sub-Fam. RHYNCOLOPHINÆ.*

Smaridia ampulligera Berl.

Dr. George, *The Naturalist*, February, 1907, pp. 43-4, no figs.

V.C. 61.—Brantingham Dale, three examples, April, 1916, T. S.

Smaris expalpis Herm.

Smaris expalpis Herm. *The Naturalist*, 1907, p. 41, figs. A. B. C. H. I. K. L.

S. hardyi Camb., *The Naturalist*, *ibid.*, pp. 42-3, figs. D. to G.

— *Science Gossip*, November, 1879, p. 249.

V.C. 61.—Weedley Springs and Brantingham Dale, T. S.

V.C. 62.—Robin Hood Bay, W. E. L. W.; Hackness, R. A. T.; Great Ayton, W. P. W.

* Rhyncolophidæ: *Erythraeus* (should be *Ritteria*) *The Naturalist*, May, 1907, pp. 179-180, figures. *Rhyncolophus*: *The Naturalist* July, 1907, pp. 259-260, figures. Both by Dr. George.

- V.C. 63.—Bradford, W. P. W.; Ainley Place; Drop Clough and Wessenden Valley; Chew Valley (Greenfie'd); Lepton Great Wood; Morton Wood (Holmfirth), all in damp situations.
- V.C. 64.—Thornton-in-Lonsdale; Kingsdale Beck and Easegill, Ingleton; Trow Gill, Clapham.
- V.C. 65.—Theirns Wood, Healaugh (Swaledale).
- Rhyncolophus phalangioides* De Geer.
T.A.T.P., plate III., figs. 54 and 57.
- V.C. 61.—South Cave, Mr. Wroot.
- V.C. 62.—Ingleby Greenhow, J. W. H.
- V.C. 63.—Hurst Wood, Shipley, Wilsden, W. P. W.; Martin Beck Wood, near Doncaster, Dr. Corbett; Kirkheaton and Lepton.
- V.C. 64.—Trench Wood, Shipley, W. P. W.; Easegill, Ingleton.
- R. regalis* Koch.
R. communis Geo., *The Naturalist*, December, 1910, pp. 427-8, and May, 1911, p. 200-1; *T.A.T.P.*, plate III., figs. 53 and 56.
- V.C. 61.—Auburn, south of Bridlington, Meaux, Welwick, Mt. Airey, T. S.
- V.C. 63.—Keighley, R. B.; Bradford, Saltaire and Hurst Wood (Shipley), W. P. W.; Lepton Great Wood and Butternab Wood.
- V.C. 64.—Grassington (Mr. Johnston); Chandler's Whin, York.
- R. pachypus* Hull.
V.C. 62.—Cleveland, Hull's 'Terrestrial Acari of the Tyne Province.'
- R. niger* Geo.
Briefly described without figures, *The Naturalist*, August, 1912, p. 252. In the index it is given as *R. communis* Geo.
- V.C. 63.—Rivock, Keighley, W. P. W. Probably not a valid species.
- Ritteria nemorum* Koch.
R. nemorum Koch, *The Naturalist*, March, 1913, pp. 109-110; figures, *The Naturalist*, May, 1907, p. 180. Common and widely distributed in the county, there being numerous records for all the vice-counties. (See *The Naturalist*, March, 1914, p. 88.)
- Belaustium miniatum* Herm.
Ritteria hirsuta Geo., *The Naturalist*, April, 1910, pp. 182-3; 1911, May, pp. 200-1. *T.A.T.P.*, plate III., figs. 66 and 67.
- V.C. 63.—Ainley Place and Lepton Great Wood.
- V.C. 64.—Stubbing Moor, near Leeds; Sawley.
- B. rubripes* Troues.
T.A.T.P., plate III., figs. 68 and 69.
- V.C. 62.—Lindale, W. J. F., September, 1911.
- B. quisquiliarum* Herm.
V.C. 63.—Whet Ings, Hebden Bridge, W. P. W.; many examples, Ainley Place bottoms, Flat Lane (Wiberlee), and Royal Clough (Scammonden). All amongst moss or at grass roots.
- Achorolophus globiger* Berl.
V.C. 64.—Brim Bray, Sawley, one example.
- A. cavannæ* Berl. (*A. norvegicus* Sig. Thor.).
Rhyncolophus mantonensis Geo., *The Naturalist*, October, 1907, p. 357.
- V.C. 61.—Hornsea Mere, T. S.
- V.C. 62.—Ingleby Greenhow, J. W. H.
- V.C. 63.—Ainley Place bottoms.
- V.C. 64.—Knaresborough.
- V.C. 65.—Deepdale, Barnard Castle, W. E. L. W.
- A. falconerii* Hull.
T.A.T.P. description, p. 29 plate III., figs. 49-52.
- V.C. 63.—Royal Clough (Scammonden), a unique example.
- A. porcinus* Hull.
T.A.T.P., plate III., fig. 48; description, p. 28.

- V.C. 63.—Maize Beck Wood, Dr. Corbett, the second occurrence only of this species,

Sub-Fam. THROMBIDIINÆ.

Allothrombium fuliginosum Herm.

Trombidium fuliginosum Herm., Dr. George, *The Naturalist*, October, 1908, p. 377, and December, pp. 453-4; May, 1911, p. 200.

- V.C. 62.—Raincliff Woods and Oliver's Mount, but not so numerous as the next, R. A. T. British examples appear to be var. *norvegicum* Berl. (J. E. H.).

Sericothrombium holosericeum Linn.

Dr. George, *The Naturalist*, September, 1908, pp. 333-336, and December, p. 453. One of the commonest of the velvet mites; it is recorded from all the vice-counties and in many places in numbers. (See *The Naturalist*, March, 1914, p. 88.)

S. scharlatinum Berl.

V.C. 61.—Hornsea Mere, T. S.

S. brevimanum Berl.

Trombidium mushami Geo. *The Naturalist*, November, 1913, p. 383.

T. buccinator Geo. *The Naturalist*, November, 1911, pp. 380-1, and November, 1914, p. 353.

V.C. 61.—Weedley, T. S.

V.C. 63.—Cold Hiendley and Winterset reservoirs, near Wakefield, in quantity.

V.C. 64.—Selby, Mr. Musham; Posforth Gill, Bolton Woods; Knaresborough.

V.C. 65.—Wood between Downholme Bridge and Marrick Priory (Swaledale).

Enemothrombium clavatum Geo.

Ottonia clavata Geo., *The Naturalist*, December, 1909, pp. 423-4.

V.C. 64.—Ingleton, F. B.

V.C. 65.—Buttertubs Pass, one female.

Var. *boreale* Berl.

V.C. 64.—Wothersome, two females.

E. pexatum K=*calycigerum* Berl.

Ottonia conifera Geo. *The Naturalist*, May, 1909, p. 194; March, 1910, p. 118.

V.C. 63.—Yateholme Wood, Holmfirth; Clowes Moor Marsden.

V.C. 65.—Semmerdale; Marrick (Swaledale).

E. bullatum Geo. (*rasum* Berl.).

Ottonia bullata Geo., *The Naturalist*, March, 1909, p. 88; 1911, May, p. 201.

V.C. 61.—Hornsea Mere, T. S.

V.C. 63.—Bradford, W. P. W.; Barrett Clough (Slaithwaite).

V.C. 65.—Marrick (Swaledale).

E. subrasum Berl.

Ottonia ignota Geo., *The Naturalist*, October, 1914, p. 306.

V.C. 63.—Holme Moss, the type specimen of *ignota* Geo. in sphagnum; Barrett Clough (Slaithwaite).

V.C. 64.—Roundhay Park gorge, ground moss on a wet bank.

V.C. 65.—Marrick, Cogden and Grinton, Swaledale.

Georgia ramosa Geo.

Ottonia ramosa Geo. *The Naturalist*, March, 1909, pp. 87-8.

O. sheppardii Geo., *The Naturalist*, August, 1913, pp. 287-8.

From Yorkshire localities, George, *The Naturalist*, August, 1913, not specified.

V.C. 63.—Deer Hill, Wilberlee, Ainley Place Bottoms, Cupwith Hill and Moor, in plenty amongst sphagnum mostly; Yateholme Wood and Holme Moss.

- V.C. 64.—Ingleborough, on the summit.
var. *simile* Halb.
- V.C. 64.—Quarry Wood, Sawley, three ♀s.
Microthrombidium pusillum Herm.
 Ottonia valga Geo. *The Naturalist*, December, 1909, p. 423 ;
 May, 1911, p. 200-1.
 Trombidium parvum Geo., *The Naturalist*, June, 1916, pp. 189-190.
- V.C. 63.—Holme Moss ; Barrett Clough, Slaithwaite ; Royal
Clough, Scammonden.
- M. simularis* Berl.
V.C. 61.—King's Mill Marsh, Driffeld, Aug., 1915, T. S. ; the only
other station is Ireland.
- Podothrombium bicolor* Herm.
 Ottonia bicolor Herm., *The Naturalist*, December, 1908, p. 452-3 ;
 February, 1910, p. 90 ; 1911, May, p. 201.
- V.C. 63.—Ainley Place, Slaithwaite.
- P. flipes* Koch.
 Johnstonia levipes Geo., *The Naturalist*.
- V.C. 64.—Ingleton.
- P. magnum* Berl.
 Second British occurrence.
- V.C. 61.—Sunk Island, T. S., 1918.
- V.C. 63.—Ainley Place Bottoms, October, 1916.
- P. septentrionale* Berl.
V.C. 64.—Stubbing Moor, 2♀s, first British occurrence, June, 1916.
- Johnstonia errans* Johnst.
V.C. 63.—Chellow Dene, Bradford, W. P. W. ; Coxley Valley,
Dewsbury ; Hey Wood, Honley.
- J. eximia* Berl.
 J. errans Geo. *The Naturalist*, August, 1909, pp. 281-2 ; May,
 1911, pp. 200-1. Doubtful if *eximia* Berl. is the correct name of
 this species.
- V.C. 63.—Morton Wood, Holmfirth ; Shepley Mill Dam, (Thunder
Bridge), where it is plentiful.
- Eothrombium echinatum* Berl.
 Ottonia evansii Geo., *The Naturalist*, March, 1909, pp. 194-5.
 O. echinata Geo., *The Naturalist*, March, 1912, pp. 74-5.
- V.C. 63.—Ainley Place Bottoms, Barrett Clough, Wilberlee and
Bottoms Wood (Slaithwaite), Drop Clough, Wessenden Valley
and Clowes Moor (Marsden).
- V.C. 64.—Austwick, C. A. Cheetham.
- Rhinothrombium nemoricola* Berl.
V.C. 63.—Ainley Place Bottoms, first British occurrence, October,
1915 ; Carr Wood, Woodsome, 1♀
- The Chester example so named in the *Lancashire and Cheshire Natura-*
list, January, 1915, p. 370, was *E. echinatum* Berl. (J. E. H.).

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Our Wild Flowers, by E. Fitch Daglish, F.L.S. London : Thornton Butterworth, Ltd., 127 pp. and 13 plates, 6/- net. This is one of the ' How to Know Them ' Series, and is intended to help lovers of the country to name the more familiar and distinctive wild flowers met with in the fields, woods, downs and moors. About 240 species are described in simple language and without the use of the scientific names of the species. A brief introduction deals with the use of descriptive terms, illustrated with text figures, and a key to the species based on the shape, size and colour of the flowers. There are twenty good figures of common species from photographs, and the frontispiece, illustrating flowers in the corn, is from an autochrome photograph.

THE COMMON CRANE FOSSIL IN BRITAIN.

E. T. NEWTON, F.R.S., F.G.S.

DURING some excavations recently made among the foundations of Walton Abbey, East Yorks. (Holocene), the tibiotarsus of a bird, measuring nearly twelve inches in length, was found by Mr. W. Pexton, and handed to Mr. T. Sheppard, the indefatigable curator of the Hull Municipal Museum, who very kindly sent it to me for examination. It is a form rarely met with as a sub-fossil in this country, and as such is worthy of being recorded.

The bone is a nearly perfect left tibiotarsus of a Crane measuring in length 30 cm. ($11\frac{3}{4}$ ins.), the least width of the shaft (55 mm. above the condyles) is 10.6 mm.; higher up and including the fibular process the width is 19.5 mm. The proximal articulation is somewhat imperfect, the cnemial crest being absent and the inner margin slightly broken away. In its present condition its width is 28 mm., and when perfect was not less than 32 mm.

The distal articulation agrees in form with that of the Crane. The width of the condyles is 21.7 mm.; the inner condyle from back to front, 21.0 mm.; the outer 19.3 mm. Seen from the front, the outer condyle is larger than the inner. There is a wide and deep depression between the condyles. The bony bridge for the extensor tendon is wide and placed towards the inner side. The lower aperture is wide, and on its outer edge is the characteristic tubercle from which a ridge passes outwards and upwards for about 17 mm. From the inner side of the upper aperture a distinct ridge extends upwards for half the length of the bone and marks the inner margin of the front surface. A similar, but less distinct, ridge marks the outer margin of the same surface. The posterior trochlea articulation is short.

Judging from these characters, and more especially from a comparison of this sub-fossil bone with recent skeletons, there can be no doubt as to its having belonged to a Crane, and its agreement in size, and in all the above-named particulars, with the skeleton of a Common Crane in the Natural History Museum, South Kensington, justifies one in referring it to the same species, *Grus cinerea* Nauman (= *Grus communis* Bechst.).

The only records of the Crane being found as a fossil in the British Isles seem to be one made by R. Harkness in 1870 (*Rep. Brit. Assoc.*, 1871, page 150), and three occurrences published by Mr. A. Bell in 1922 (*The Naturalist*, August and September, 1922, p. 253). The first of these was found with other bones in a Kitchen Midden at Ballycotton, Cork. The other three are from Holocene deposits at London Wall,

Norwich and Corbridge. Specimens from the Fens are preserved in the Cambridge Museum.

The Common Crane was at one time a regular visitor to our Eastern Counties, but since the beginning of the nineteenth century its visits have been very irregular.

The following references to the former occurrence of the Common Crane in Britain may be useful :—

Howard Saunders : "Yarrell's British Birds," 4th edit., Vol. III., p. 178, 1884.

Alfred Newton : "A Dictionary of Birds," Vol. I., p. 109, 1893 ; and "Encyclopædia Britannica," 8th edit., Vol. VII., p. 367.

F. E. Blaacew : "Monograph of the Cranes," Leiden and London, 1897.

T. H. Nelson : "Birds of Yorkshire," Vol. II., p. 547, 1907.

The specimen forming the subject of this note is to be preserved in the Municipal Museum, Hull.

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FIELD NOTES.

BOTANY.

Crepis taraxacifolia at Withcall.—While recently searching for the Bee Orchid, Miss Marsden, of Louth, found *Crepis taraxacifolia* at Withcall (Div. 8). This species has not previously been recorded for Division 8.—C. S. CARTER, Louth, Lincs., July, 1923.

Claytonia perfoliata at Mablethorpe.—In April of this year I found *Claytonia perfoliata* growing most luxuriously and blooming on the sandhills at Mablethorpe (Div. 9). I learn from Mr. J. Larder, who I regret is now suffering so acutely, that the late Miss Nash found this species growing there a few years ago, but that it had not yet been recorded for that division.—C. S. CARTER, Louth, July, 1923.

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MAMMALS.

The North American Grey Squirrel in Yorkshire.—It is not wise to generalise too much from the fact of one or two individuals turning up in any district. Many are now kept as pets, and may escape, or be liberated. I know a case at present where a gamekeeper in the North Riding is commissioned by the shooting-tenants to trap Grey Squirrels to be sent to Leeds, to be liberated in the neighbourhood of Roundhay. The experiment had not met with much success up to the present, as my informant had then only succeeded in trapping and sending one alive.—H. B. BOOTH, Ben Rhydding.

MOLLUSCA.

Paludestrina jenkinsi at Mablethorpe.—In a drain with a slightly gravelly bottom at the level crossing near Strawberry Bank, Mablethorpe (Div. 9), I found *Paludestrina jenkinsi* in considerable numbers. This species has not been previously recorded for this division. Other species of mollusca associated with it were *Bythinia tentaculata*, *Sphaerium lacustre* and *Planorbis vortex*.—C. S. CARTER, Louth, July, 1923.

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GEOLOGY.

A Deep Well-bore at Scallows Hall, Binbrook.—Through the kindness of Miss Brewster, I am enabled to place on record the Section of Strata through which a bore was made by F. Smith & Son, Grimsby, for her at Scallows Hall, Binbrook, (6-in. map, sheet 39 S.W.). This being the deepest bore in the district, it is important as furnishing a useful datum line for studying the solid geology of the area :—

2' 0"	Silty clay
17' 0"	Clay and chalk
10' 0"	Loose chalk
212' 0"	White chalk
10' 0"	Red chalk
34' 0"	White chalk
10' 0"	Red chalk
5' 0"	Green clay
19' 0"	Green sand containing water
11' 0"	Green sand and clay
5' 0"	Green sand containing water
5' 0"	Green clay

 340' 0"

Water level 263 ft. below surface.

These are the particulars as supplied by Messrs. Smith. The uppermost '10 ft. of Red Chalk,' is doubtless the lower Pink Band of the *Holaster subglobosa* zone, characteristic of the Louth district. The nearest bench mark, about 200 yards away, is recorded as 342. The surface at the bore being approximately the same altitude, the bottom of the bore will be about sea level.—C. S. CARTER, Louth, July, 1923.

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We regret to record the death of Sir Henry H. Howorth, K.C.I.E., author of 'Ice and Water,' 'The Mammoth and the Flood,' and numerous other volumes. He had probably been the president of more scientific societies than any of his contemporaries.

MOLLUSCA NEAR GRASSINGTON.

GREEVZ FYSHER.

THE Yorkshire Geological Society had an excursion to Grassington on the 8th June, and as a good deal of rain fell the terrestrial mollusca were active and plentiful. The following list is verified by Mr. H. Sowden, York.

SKIPTON ROAD, GRASSINGTON.

- | | |
|--|--------------------------------|
| 26 <i>Helicigona arbustorum</i> . | 6 <i>Helicigona lapicida</i> . |
| 6 <i>Hygromia rufescens</i> , mostly young ones. | |

LINTON.

- | | |
|---|--------------------------------|
| 1 <i>Helix hortensis</i> . | 1 <i>Helicigona lapicida</i> . |
| 36 <i>Hygromia rufescens</i> , mostly young ones. | |

KETTLEWELL.

- | | |
|--|----------------------------------|
| 2 <i>Helix hortensis</i> | 9 <i>Limnæa pereger</i> , young. |
| 21 <i>Hygromia rufescens</i> , mostly young. | |

THRESHFIELD.

- | | |
|------------------------------|--------------------------------------|
| 5 <i>Helicigona lapicida</i> | 1 <i>Helicigona nemoralis</i> . |
| 11 <i>H. arbustorum</i> . | 1 <i>Hygromia rufescens</i> , young. |

GRASS WOODS.

- | | |
|---|---------------------------------|
| 5 <i>Clausilia cravenensis</i> . | 1 <i>Ena obscura</i> . |
| 1 <i>H. hortensis</i> , young. | 1 <i>H. arbustorum</i> , young |
| 2 <i>Hygromia hispida</i> . | 2 very young <i>Clausilia</i> . |
| 3 <i>Cochlicopa lubrica</i> , two of them young ones. | |
| 1 <i>Jaminia cylindracea</i> . | 2 <i>Vitrea crystallina</i> . |
| 2 <i>H. hortensis</i> , young. | |

THRESHFIELD.

- | | |
|--|--------------------------------|
| 30 <i>Hygromia rufescens</i> , all young except three. | |
| 16 <i>Helicigona arbustorum</i> . | 5 <i>Helicigona lapicida</i> . |
| 6 <i>Clausilia</i> (<i>rugosa</i> and <i>bidentata</i>), two young ones. | |
| 1 <i>Cochlicopa lubrica</i> , and two very young <i>Clausilia</i> . | |

NEAR BARDEN TOWER.

- | | |
|---------------------------------|----------------------------------|
| 13 <i>Helicigona lapicida</i> . | 5 <i>Clausilia cravenensis</i> . |
| 2 <i>Hygromia rufescens</i> . | |

Gordale Scar was visited during the same excursion, and the following, verified by Mr. Taylor, were observed.

GORDALE SCAR, under stones, June, 1923.

- | | |
|-----------------------|-----------------------|
| Hyalinia cellaria | Pyramidula rotundata. |
| H. alliaria. | Clausilia bidentata |
| Hygromia rufescens. | Hyalinia crystallina. |
| H. hispida. | Pupa umbilicata. |
| Pyramidula rupestris. | |

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Poultry : Light Breeds—and How to Know Them, by E. C. Ash. London : Epworth Press, 62 pp., 1/6 net. Most people, at some time or other, desire to keep a few fowls. The chief difficulty with the beginner is to decide which breed to take up. We have just seen a new book by the Epworth Press, which gives full guidance and information about all the better known, and some little known light breeds, accompanied by good illustrations. Do you know the 'Buttercup,' or the 'Frizzle,' or the 'Orloff,' and that curious bird with a thirty foot tail? Anyhow, whether you desire to keep just a few birds, or to be a specialist, you will learn much from this book.

CORRESPONDENCE.

OTTERS AT MEANWOODSIDE.

Sir,—May I venture to hope Mr. Jasper Atkinson will follow up his interesting notes on the five Otters at Meanwoodside—telling us what became of them? That farmers, otter hounds and boys should leave them alone is inconceivable. Presumably the footpath was on the other side of the small stream and overlooked the drain? I know what very small water courses fish and otters can make use of. As I write I have over my table a fat pound trout. Some years ago, in Cornwall, standing speaking to a friend, we suddenly saw a full sized otter jump out of a stream of hardly a foot of water with this fish. On seeing us only twenty or thirty feet away, it lept back, splashing down stream and disappeared. That otters eat and therefore catch birds is quite new to me. Can any of your readers corroborate the interesting suggestion made by Mr. Atkinson?—ARUNDEL LEAKEY, M.A.

—: o :—

The Irish Naturalist for July is almost entirely occupied by a paper on the 'Origin of the Irish Cattle,' by Dr. R. F. Scharff.

A 'Whale Thrasher fish,' 14 feet long, was landed at Cullercoats on June 30th, having been caught in a salmon net.

Mr. Fred Lawton, of Skelmanthorpe, has just completed his fiftieth year of membership of the Yorkshire Naturalists' Union.

Mr. William Falconer has recently been the recipient of a presentation on his retirement from the Colne Valley School after over forty-seven years' service as teacher and headmaster.

'Science on Holiday: Points about English Playgrounds,' which is illustrated by a fine series of photographs, appears in *Conquest* for July. There is also a useful note on the Preservation of Timber.

Discovery for July contains 'Suspended Animation,' by Sir Arthur E. Shipley; 'Lime and Whiting Manufacture in Lincolnshire,' by R. C. S. Walters; and 'The Respiration of Insects,' by I. Leitch.

Among the contents of *The Journal of the Ministry of Agriculture* for April we notice 'White Clover,' by R. G. Stapledon; 'Prevalence of Dodder in Great Britain,' 'Violet Felt Rot (Rhizoctonia) of Clover' by W. M. Ware; and 'The Colorado Beetle.'

Among the contents of *The Transactions of the Lancashire and Cheshire Antiquarian Society*, Vol. XXXIX., we notice the 'Culinary Use of Roman Mortaria,' by J. J. Phelps; 'Quick Moor,' by C. E. Higson; and a record of a neolithic axe found at Great Budworth, Cheshire.

Part VIII. of Hutchinson's *Animals of all Countries* is devoted to squirrels, beavers, rats and mice; many of the beaver illustrations being quite remarkable. Part IX. also refers to rats, mice, porcupines, rabbits, etc., and Part X. follows on with oxen, buffaloes, sheep and goats.

The twenty-seventh volume of *Transactions of the Institution of Water Engineers* contains W. J. E. Binnie's Presidential Address; 'Chester Waterworks, Past and Present,' by F. Storr and C. W. Bennett; 'Progress in Water Purification,' by Sir Alec Houston; and many other papers.

In *Nature*, No. 2792, Professor S. J. Hickson describes some Hydra which he obtained at the south end of the tunnel from Lake Thirlmere; which were largely of a milk-white colour, but he came to the conclusion that they were only a white variety of the common *Hydra viridis*, and were probably the offspring of parents living in the tunnel.

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NOTES AND COMMENTS.

CARLISLE NATURALISTS.

We should like to congratulate the Carlisle Natural History Society upon the appearance of Vol. III. of its *Transactions*, a substantial pamphlet of over 100 pages, containing three most important monographs of particular value to naturalists interested in the Lake District area. These are :—Addenda to Macpherson's 'Vertebrate Fauna of Lakeland' (Birds), by (the late) Eric B. Dunlop, with Appendix by Linnaeus E. Hope; 'The Lepidoptera of Cumberland,' Part III., Geometrae, by George B. Routledge; 'The Coleoptera of Cumberland,' Part III., by Frank H. Day. The volume is well printed, and at the comparatively low price of 3s. 6d. should have a ready sale.

THE NEW NATURAL HISTORY.

The Twenty-fifth Robert Boyle Lecture, entitled 'The New Natural History,' by Professor J. Arthur Thomson, has been published by Humphrey Milford at Oxford, at 1s. net. The Professor states :—'As we cannot profitably use the term Natural History in the old very wide sense, and as there is no advantage in using it as a synonym for Zoology, I plead for retaining it as a designation for the study of the habits and surroundings of living creatures, their inter-relations with one another. Natural History in the hands of many of the old naturalists certainly had this meaning. It corresponds to what one of the great zoologists called the higher Physiology; the Physiology of Organisms, rather than of organs. It is more or less equivalent to what is called nowadays—ecology or bionomics. I plead indirectly for the more honourable recognition of Natural History as a well-defined and integral department of biological science, and I wish more particularly to consider some of the changes that have come about in Natural History since the days of that evergreen book, Gilbert White's *Natural History of Selborne*, or, since, Reamur's magnificent *History of Insects*.'

ROCHDALE MUSEUM.

We have received the *Fifty-second Annual Report of the Public Libraries, Art Gallery and Museum Committee of Rochdale* for 1922-23, which contains a List of Additions and the names of the donors to the Museum. Among the additions we notice 'a further collection of Egyptian antiquities, consisting of objects chiefly of the First Dynasty, presented by Alderman J. R. Heape, J.P., and Mr. Charles Heape, J.P. As a result of their continued and generous gifts the Committee is faced with the problem of providing further display accommodation, the existing accommodation being insufficient to meet the present needs. In addition to the above a number

of interesting local views and museum specimens was presented during this year. Special mention should be made of a portrait of Tim Bobbin in his later years, presented by Mr. R. S. Close, Senr. ; a series of framed microphotographs (sic) presented by Mr. Isaac Renshaw ; a plaster bust of the late Alderman George Leach Ashworth, presented by the Rochdale Temperance Society ; three cases of tropical butterflies and moths, presented by Mr. George B. Leach ; and a classified collection of shells in a special cabinet, presented by the executors of the late ex-Councillor J. P. Ormerod.'

BIG BUD.

The Eighty-third Annual Report of the Crichton Royal Institution, Dumfries, has the following interesting observations by Dr. C. C. Easterbrook :—' The disease known as " Big Bud," due to the currant gall mite, which attacks and destroys black-currant bushes, is widespread throughout the country, and hitherto no remedy has been discovered. It attacked the black-currants in our main orchard about eight years ago, and the best recognised remedies were applied without success ; and although the method of cutting to the ground and removing and burning the branches was also tried four years ago, the young growth from the stools became affected even more extensively than before. At the suggestion of the Convener of the Gardens Committee (Sir George Watt), who is personally supervising the experiment, the plot of ground in the orchard containing the black-currant bushes, 427 in number, was completely covered round the bushes with wheat straw and dead branches, which were then ignited, the burning of the plot being carried out on the 28th March. To make doubly sure of the desired object of this experiment, namely, the extermination of the pest not only on the bushes, but possibly also on the plants, the plot was again covered with a layer of straw, the scorched branches of the bushes were cut off within six inches of the ground and laid on the straw, and the whole was again burned. So far the experiment has been a success, for (1) less than 10 per cent. of the bushes have been lost ; and (2) fully 90 per cent. have made a good recovery, showing a two to three feet growth of clean healthy wood, with flower buds giving promise of a half crop next summer—that is, as soon as if new bushes had been planted, but without the cost of the latter—and finally, with no indication of the mite on the plants by the end of the year.'

TEMPLENEWSAM.

We learn from *The Yorkshire Post* that ' Sir Charles Wilson's intimation to the Leeds City Council that " great collections are coming to Templenewsam " has naturally aroused great

interest. One of them was a valuable collection of arms. It was at present in store, however, and the task of sorting suitable exhibits would take some time. As was evident from the discussion at the meeting of the Council, agreement on details has not yet been reached in the development of the idea that Templenewsam shall eventually house a number of the city's treasures, some of which are now in the City Museum in Park Row. The difficulty has arisen because the Museum Committee have wanted to know first of all what space will be available for them, while the Templenewsam Committee have requested, as the first step, a list of articles which the Museum Committee proposed to send. It is reported that it was the intention of the Museum Committee to carry out the idea in the spirit of the house and to the credit of the city generally. The Museum at present contained articles which would be suitable for the mansion. There was, for instance, a priceless collection of Greek and Roman Marbles, a number of articles relating to old Leeds, and a quantity of fine duplicated specimens of stuffed English birds. The official opening of Templenewsam, it is now stated, will probably take place in October, with Sir Montague Barlow, M.P., the Minister of Labour, to perform the ceremony.

INCONGRUOUS EXHIBITS.

This calls for a reply from *Minerva*, as follows:—‘ With reference to the suggestion which has been made with regard to the transferring of objects from the Museum in Park Road, Leeds, to Templenewsam, it is to be hoped that before anything of the kind is done, some definite scheme may be laid down as to the nature of the collections to be shown at Templenewsam. If that magnificent mansion is to be shown to the best advantage, a strict eye should be kept on all attempts to place in it objects which are incongruous. What possible interest can “ stuffed birds,” or worse still, “ duplicated specimens of stuffed English birds ” (vide *Yorkshire Post*) have in a place such as this, and similarly the collections of Greek and Roman Marbles are better where they are, as they cannot very well fall in with any scheme at Templenewsam, which should be devoted to illustrating the various periods in English history, and especially that of Leeds and district; the furniture, tapestries, pictures and other objects for which the building is so admirably situated.’

MAN'S MENTAL CHARACTERISTICS.

In some notes on ‘ The Correlation of Mental and Physical Characteristics in Man,’ by Professor J. L. Myers, in *Man* for August, he states:—‘ There is a general belief, based on wide popular experience, that particular temperaments may be presumed to accompany certain physical peculiarities, such as red hair, an amber-coloured or a steel-blue eye, a “ cupid’s-

bow" mouth, a "horse face"—like that in the eighteenth century portrait of Alderman Hinderwell in the Town Hall at Scarborough, whose surname commemorates so neatly its mental counterpart. Some of these physical and mental counterparts are sufficiently widespread over large areas as to claim provisional acceptance as racial qualities: the plodding, detail-loving industry of the mid-European "Alpine" strain; the restless, imperious individualist "drive" of the "Boreal" blonde. Others, like the red pigmentation already mentioned (which recurs in the more artificially established breeds of horses, cattle, dogs, cats and poultry), seem to result from disturbance of physiological and psychological make-up by cross-breeding.'

WAKEFIELD MUSEUM.

We learn from the press that a start has been made by the Corporation of Wakefield towards the formation of a public Museum and Art Gallery. The Victoria and Albert Museum, South Kensington, has lent some objects. Various paintings of a somewhat miscellaneous character have been given, and we learn that:—'more interesting from one standpoint is the collection of relics in the Museum. These include old notes issued by private banks, tokens and coins in use many years ago, and bullets and cannon ball found at Sandal Castle and Lawe Hill. One bullet, found on Lawe Hill less than a month ago by Mr. R. E. Clarke, is believed to be one of those fired in 1643, when Sir Thomas Fairfax defeated the Royalists. Other exhibits include examples of the "Waite's badge," worn by the night watchman in the streets of Wakefield in the seventeenth century; Roman coins found at Stanley; armour and weapons in use centuries ago, as well as a German sniper's helmet and breast-plate, and two machine guns captured by local troops in the Great War, with relics of the Waterloo and Peninsular campaigns. There are also cases containing collections of British and foreign birds, and of moths, butterflies, etc., with numerous geological specimens. The town is fortunate in having, as curator, Mr. Harold Parkin, whose father was a well-known local naturalist.'

THE SMALL MUSEUM.

The Presidential Address of the Museums Association dealing with the question of the small museums seems to have been well received by the Press; the papers at Sheffield, York and other places being particularly flattering; *The Yorkshire Herald* going so far as to suggest that a copy should be sent to every town council in the country. It remains for a Leeds paper, however, to find something funny in the Address, but beyond stating that Leeds is the last place in the country to

make any criticism on the museum question, we refrain from more than quoting the notice in question. 'Enthusiasm nearly always affords food for laughter; and it would be easy to make fun of the enthusiasm for small museums displayed by certain speakers at Hull. If every ancient building is to be preserved and made to house appropriate relics and curios, a time is bound to come when our towns and cities will be mostly museums; for every building will be ancient enough if we only give it time. Yet we should not be very wise if we went off on that tack, however amusing we might be. Though the case may have been stated somewhat extravagantly at Hull, there really is a case for the small museums.'

BIG MUSEUMS.

'Big museums, such as the British Museum, are a scientific necessity, because they enable a specialist to prosecute his studies in a way he could not do otherwise; but to the casual visitor they are apt to prove wearisome and bewildering. Footsore and eyesore he must be after wandering a few hours in one. The small museum, if its contents are well chosen, is instructive to the layman because its contents are not beyond his grasp. The worst of the small museum is that it is apt to be scrappy. You get a little of everything, and enough of nothing. The small are too apt to emulate the large ones; whereas, if they confined themselves to local matters, they would be both helpful and interesting. Most large towns, for instance, could do with a museum of local industries; and the mansion at The Hollies would make a fine museum for Leeds antiquities.'

SUBMARINE EROSION.

In a paper with this heading in *The Geological Magazine* for July, Mr. C. Thompson points out that: Submarine erosion off Holderness is a fact, as pointed out by Allanson Winn; the rate is greatest between High and Low Water Marks; between Low Water and 20 feet it is much less rapid; below 20 feet it still further diminished to the 30 feet line, outside which it apparently dies away; Groynes—taking the long view—are unfortunately only a temporary safeguard for this district of easily eroded clay.

THE MUSEUMS ASSOCIATION.

Few towns can compete with Hull as a conference centre, and the impressions of a looker-on at the meetings of the above Association, held from July 9th to 22nd, may be permissible. Whatever the subject of the conference, the Curator of the Hull Museums has usually a 'finger in the pie.' In this instance, in his role as president of the Association, in which he has taken an active interest for many years, he could

exercise a dominating hand. His long experience enabled him to make arrangements on a generous scale, and to this end he secured the aid of the ablest lieutenants. The Lord Mayor of Hull (Councillor C. Raine), who received the members and delegates, is a host in himself, and obviously takes a delight in welcoming, in true Yorkshire fashion, visitors to the town of which he is the head, and of which he is so justly proud. He has the happy manner of making everyone feel at home and truly welcome. He was ably supported by Ald. P. T. Crook, Chairman of the Museums Committee, who, notwithstanding his advanced years, did much by his generous interest to make the visit a memorable one. The selection of Mr. James Downs as local secretary was equally happy, and members will long have pleasant recollections of his geniality and kindness.

DISCUSSIONS AND EXCURSIONS.

An account of the papers and discussions will be found elsewhere in this issue. To an outsider, these contributions gave the impression that museum curators had little of general or even special interest to discuss, and that as a body they lacked vitality, enterprise and originality. It was remarked that in these respects the meeting was not up to its usual standard, certainly it was disappointing. The President led off with an excellent topic: 'The Place of the Small Museum,' but the idea seemed strange to the members and little was made of it. No one seemed to appreciate the fact that the small museum gave an opportunity to deal with special aspects of local natural, human or industrial history, and so obviate the medly which often results from crowding everything into a central building; some deprecated the idea on the plea of difficulty of control and management. The well arranged excursions were of much interest and the local people at Beverley and York did their best to make the visits profitable. The great wealth of local material at York made one marvel at the suggestion to make here a 'Yorkshire Museum.' Why attempt the impossible and so jeopardize the unique opportunity to build up here a local museum of first-class importance?

DANISH MUSEUMS.

Directly we crossed the North Sea we saw the idea of special museums carried out with a completeness which surprised every visitor. Here in Copenhagen, in a country left bankrupt after the war with Germany little more than half a century ago, we found nine magnificently equipped museums, most of them devoted to an intensive study of Danish history and development. Each museum is in charge

of a highly trained director, and, in sharp contrast to many British museums, special attention is paid to arrangement in chronological order of the material displayed. As noticed elsewhere, visits were made to the National Museum, with its extraordinary prehistoric, historic and ethnographic collections, the museums of mineralogy, zoology, botany, applied arts, also the National Gallery, the Hirschsprung Collection of Danish pictures, and the two Museums of Statuary, the Thorvaldsen's Museum, and the magnificent Glyptoteket, which are models of museum arrangement and decoration. These visits were made under expert guidance, accompanied by unbounded hospitality. The Danes have converted three Royal palaces into museums: the Rosenborg Castle, where are the Chronological Collections of the Danish Kings; Fredriksborg Castle, a National Historical Museum; and Kronborg Castle at Elsinore (the scene of 'Hamlet') is a Museum of Naval History. The Open-air Museum at Lyngby created very great interest. This is a collection of homesteads with their furnishings, from primitive times to the present day, showing admirably the progress of social development. A collection of Yorkshire homes on similar lines would well repay the effort and cost. A feeling deeply impressed on some of us was that British museums are too often 'warehouses' of interesting objects rather than institutions for the chronological and effective arrangement of material of educational value.—W.

OUTRAM LINES.

In a paper on Coal-mining near Sheffield from 1737 to 1820 (*Trans. Inst. Mining Engineers*, Vol. XLV., Part 2), it is stated 'In 1774, Mr. John Curr was experimenting with cast-iron rails He laid plates of cast-iron, made to his pattern by Mr. James Outram, of Ripley. The arrangement not proving satisfactory, Outram devised plates with a flange, to keep the trucks on the track, and laid them on cross wooden sleepers. These sleepers having been maliciously torn up, were replaced, first by cast-iron boxes, and then, these being also destroyed, by stone blocks. In this form "Outram ways" (whence tramways) were largely employed in the Colliery districts in the Midlands, South Wales, and other parts. They were long preferred to the "edge rails" on which flanged wheels ran, invented by Mr. W. Jessop, partner with Benjamin Outram (James's son) in the Butterley Iron Works.'

—:o:—

A memoir and photograph of the late William Stevenson, formerly of Hull, later of Mansfield, Notts., appears in *The Transactions of the Thornton Society*, Vol. XXVI.

The Proceedings of the Cambridge Antiquarian Society, No. LXXII., contains papers dealing with the Excavations of Prehistoric Earthworks, and Some Early Scribed Rocks of the Isle of Man.

FIELD NOTES.

Otters eating Birds.—Mr. Leakey may be assured that otters can and do catch water-birds. I have some waterfowl here, and do my best to keep otters out of the enclosures, for I have several times lost valuable birds. I think in every case we have trapped the offender, though I am very unwilling to do so, and we do not systematically kill them. On May 15th last, a bitch otter (14 lbs.) somehow got in amongst my birds, and killed a Lesser White-fronted Goose, and a Japanese Teal, besides destroying several clutches of eggs. My keeper pegged down the remains of the goose, and the otter was trapped. In the autumn of 1919 otters got in twice, and killed a Ross's Snow Goose, and a Brent Goose, besides a tame Curlew and nine ducks, all of rare species, and unfortunately breaking up several breeding pairs. I can recall six other instances of ducks being killed here by otters. But a friend of mine, M. Delacour, who has a splendid collection of birds in France, had still more provoking losses some three years ago. Otters paid repeated visits, getting under some masonry which had not been sufficiently sunk into the bed of a stream. I think about 40 birds were killed in this case, before the otters were shot at night. From what I have noticed, the otter generally seizes the bird from below, diving under it, and giving it one terrible grip with his powerful jaws, and often leaving it without further injury.—W. H. ST. QUINTIN.

Otters feeding upon Birds.—I can personally testify that otters will attack birds, because, when walking along the banks of the Wye river in Herefordshire, in 1903, an adult otter emerged from water, and after a few seconds it made a sudden rush at a sparrow about 8 feet away, grabbing with its mouth—after which it returned at once into the water. Water-fowl such as adult Wigeon and Teal ducks are at times captured by otters; and an acquaintance told me that an otter caught a duck when it was swimming, the otter diving under water and pulling the duck down by its feet, then diving again brought it to shore and ate it. In *The Avicultural Magazine*, March, 1920, page 54 :—‘Contents of Heron's Stomach,’ remains of rats, Dytiscus and other water beetles, etc., exhibited at meeting of London Aquarium Society. Otter killing ducks, *The Avicultural Magazine*, 1921, p. 114, recorded by J. Delacour. ‘An otter got through gate on river . . . and killed over 30 ducks’ . . . also ‘a Bar-headed Goose,’ ‘Six ducks and one goose were more or less eaten.’ ‘It never caught a bird unless swimming on water.’—FREDERICK D. WELCH, M.R.C.S.

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Mr. G. T. Porritt writes on Melanism in Lepidoptera in *The Entomologist* for July.

ON A NEW FOSSIL FISH (*ANOGLMIUS ORNATUS*,
SP. NOV.) FROM THE LOWER CHALK OF SOUTH
FERRIBY, LINCOLNSHIRE.

ARTHUR SMITH WOODWARD, LL.D., F.R.S.

PART of a fossil Teleostean fish lately obtained by the Hull Museum from the Lower Chalk (zone of *Holaster subglobosus*) of South Ferriby, Lincolnshire, is interesting as belonging to *Anogmius*, a genus hitherto known only from the Niobrara Chalk of Kansas, U.S.A.* It seems to represent an extinct family related to the Tertiary and living Osteoglossidæ and Albulidæ.

The specimen comprises the greater part of the head and trunk as far back as the pelvic fins, shown in direct side view in the counterpart halves of a slab of hard chalk. The right side of the specimen is drawn in outline of about one-third the natural size in Fig A. of the accompanying illustration, with a few vertebrae and fragments of the pelvic and dorsal fins added from the opposite side. The lower dental plates are also drawn of one-half the natural size in Fig. B, from separate remains of the head which are not represented in the other figure.

Among the fragmentary remains of the head, several characteristic features are recognisable. The postorbital cheek-plates (*po.*) are very thin, and marked only by a few fine radiating ridges. The triangular quadrate bone (*qu.*) is deeply cleft behind, where it clasps the relatively large and stout symplectic (*s.*). A long and thin lamina of bone flanking the great upper dental plate may be a toothless ectopterygoid. This dental plate, which is much broken, exhibits the usual structure, and is concave on its oral face. It seems to extend along the whole length of the mouth, and its upper face exhibits the same very fine and more or less reticulate markings as the upper face of the corresponding dental plate in *Plethodus*.† The deep and wide premaxilla is ornamented on its flat outer face with fine oblique ridges which pass into tubercles near the oral border. Its oral face exhibits the usual pits for the insertion of minute conical teeth. Such teeth are actually seen on a fragment of the front end of the mandible. Of the two lower dental plates (Fig. B), the hinder and larger is complete, only distorted in

* See especially O. P. Hay 'On Certain Genera and Species of North American Cretaceous Actinopteros Fishes,' *Bull. Amer. Mus. Nat. Hist.* Vol. XIX. (1903), pp. 26-47; also A. S. Woodward, 'Fossil Fishes of the English Chalk' (*Mon. Palæont. Soc.*, 1907), p. 105.

† A. S. Woodward, *op. cit.* 1907, p. 108, pl. XXII., figs. 2a, 3.

front by crushing at the sides, while the anterior plate is merely shown in part in impression. The convex oral surface of these plates is completely covered with a regular coarse reticulation, and there are no traces of denticles in the pits. The hinder plate is much expanded in front, but constricted behind into a small lobe, as shown in the diagram (Fig. B). The ceratohyal (*ch.*) is short and stout, though laterally compressed, and its hinder end as usual is deeper than its anterior end. The epihyal (*eh.*) is a short and deep triangular lamina of bone. The preoperculum (*pop.*) is broad, expanded at the angle, and marked by delicate reticulating ridges which radiate from a slight median longitudinal ridge. A fragment of the operculum shows a coarse and somewhat reticulating ornament of ridges, which radiate from the point of suspension. The branchiostegal rays are numerous, the upper (*br.*) being in close series, broad and longitudinally striated, while those supported by the ceratohyal are smaller, more slender and spaced.

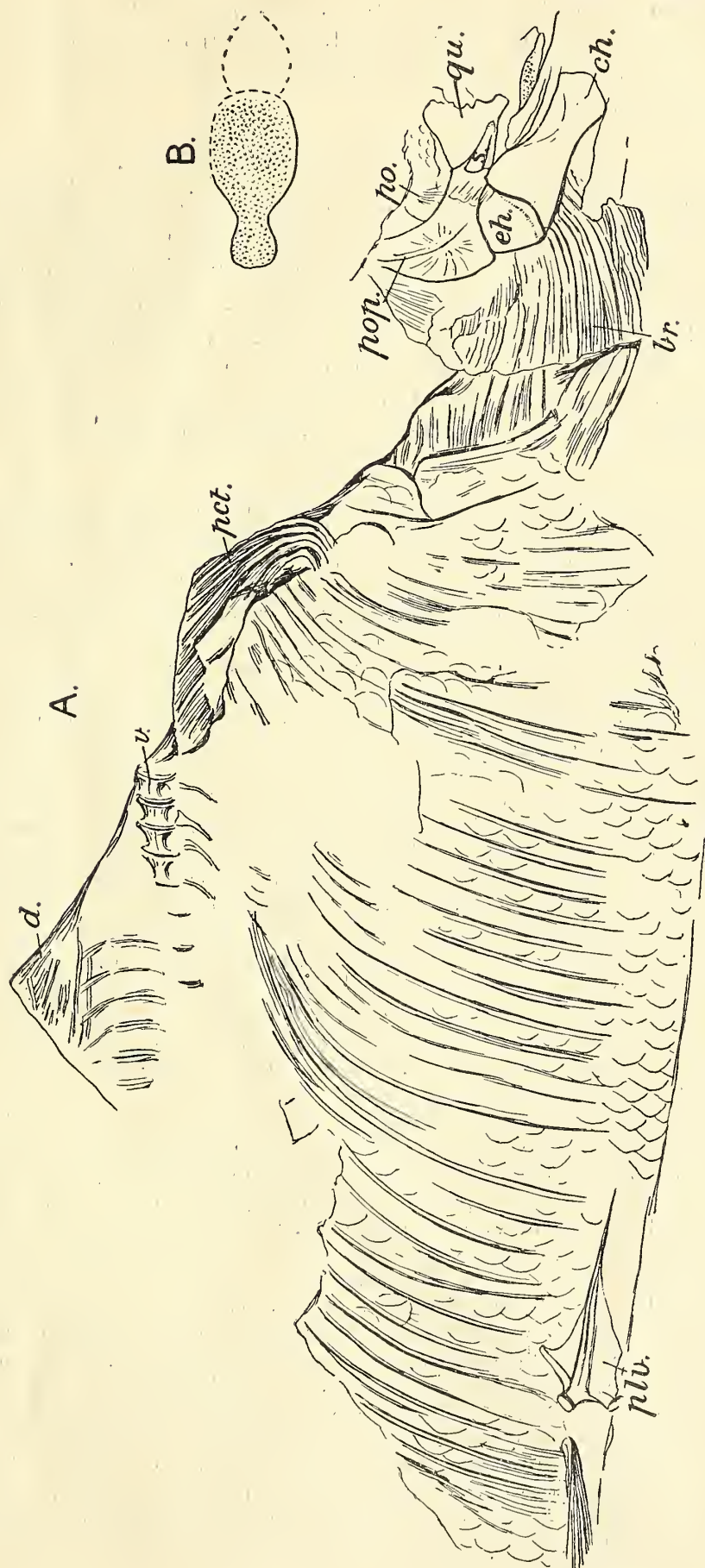
Four of the vertebral centra (*v.*) in the anterior half of the abdominal region seem to be somewhat deeper than broad, and exhibit a deep pit for the insertion of the rib. Their sides are clearly not pitted, but marked by fine longitudinal striations. The ribs are stout and very conspicuous in the fossil, extending to the ventral border of the fish.

The basal part of one of the pectoral fins (*pct.*) is preserved high up on the flank. Its stout, smooth rays are recurved at their insertion, and evidently much divided at their distal end. The pelvic fin-supports (*plv.*) are much elongated, tapering forwards, and apparently united in the middle line.* Each is strengthened by a longitudinal rod, and much thickened at the end for the insertion of the pelvic fin, which must have been well developed. Fragments of the supports of the dorsal fin (*d.*) show that it extended forwards at least as far as the middle of the abdominal region.

Cycloidal scales, deeply overlapping and in regular series, cover the whole of the trunk preserved, and many of them are well displayed. Their exposed portion is completely covered with fine and close, beaded, longitudinal ridges or rows of minute tubercles. The lower border of the abdominal region seems to have been acute, but there are no thickened or enlarged ridge-scales.

In the British Museum there are several specimens of *Anogmius* from the Kansas Chalk, which are available for comparison, and prove that the new fossil now described is referable to the same genus. This fossil, however, differs

* An isolated pelvic fin-support is well seen in a specimen of *Anogmius aratus* from the Chalk of Kansas in the British Museum (No. P.9202).



from all the known species in the shape of the hinder lower dental plate, and probably in the fine close ornament of the scales. It may therefore be regarded as the type of a new species, *Anogmius ornatus*.

DESCRIPTION OF ILLUSTRATION.

Anogmius ornatus sp. nov. ; imperfect head and abdominal region, side view (A), and lower dental plates, oral view (B), one-half natural size—Lower Chalk (zone of *Holaster subglobosus*) ; South Ferriby, Lincolnshire. Municipal Museum, Hull ; *br.* branchiostegal rays ; *ch.* ceratohyal ; *d.* some supports of dorsal fin ; *eh.* epihyal ; *pct.* pectoral fin ; *plv.* pelvis ; *po.* postorbital cheek-plates ; *pop.* preoperculum ; *qu.* quadrate ; *s.* symplectic ; *v.* vertebral centra.

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The *Report of the Colchester Museum* for the year ending March, 1923, contains a well-illustrated account of the many valuable local antiquities which have been added during the year.

The *Proceedings of the Society of Antiquaries of Newcastle-upon-Tyne*, recently issued, contains an exhaustive article on Early Earthworks in Northumberland, by R. Cecil Hedley.

The *Transactions of the Lincolnshire Naturalists' Union* for 1922 contain the Rev. Canon A. N. Claye's Presidential Address on 'Some Ecological Features and Problems in Plant Life,' and the Reports of the Sectional Officers, together with a portrait and brief memoir of Thomas Stow.

The *Caradoc and Severn Valley Field Club* has published its *Record of Bare Facts for the Year 1922*, in which occur the summaries of observations under the various sections of Botany, Zoology, etc. The same Club's *Transactions* include abstracts of papers read at the meetings, an occasional paper *in extenso*, and Reports of Excursions.

Under the editorship of A. Deane, *The Proceedings and Reports of the Belfast Natural History and Philosophical Society* for 1921-22, have recently been issued (viii. + 131 pp., 5/-). There are several important contributions, many of which are well illustrated. Among them we may mention 'Ulster Philosophers,' by Prof. J. Laird ; 'More about the Erectness of Plants,' by Prof. J. Small ; and 'Recent Investigations on the Fuel Problem,' by Prof. H. Wren.

The *Whitby Literary and Philosophical Society* has issued its *Hundredth Annual Report*, upon which event we offer our sincere congratulations. Besides natural history, geological and meteorological reports, the Society publishes two important monographs, one dealing with the Parish Church of St. Mary, Whitby, by T. H. Woodwark ; and another on 'An account of some Mediæval Roads crossing the Moors south and south-west of Whitby,' by J. T. Sewell.

Volume LXVI. of *The Memoirs and Proceedings of the Manchester Literary and Philosophical Society* contains four valuable memoirs, including one on 'The Preservation of our Fauna,' by T. A. Coward ; and one on 'The Cultural Significance of the Use of Stone,' by W. J. Perry, as well as the Annual Report, etc., of the Society. Part I, Vol. LXVII., contains 'Manchester Birds : 1822 and 1922,' by T. A. Coward ; 'Ancient Legend as to the Hedgehog carrying Fruits upon its Spines,' by Miller Christy ; and 'The Phytoplankton of Rostherne Mere,' by W. H. Pearsall, and we are glad to see that in this instance each memoir is not paged separately, which proves a little inconvenient for reference, seeing that they are all bound in one cover.

THE PLACE OF THE SMALL MUSEUM.*

T. SHEPPARD, M.SC.

IN this country we are proud of our great national institutions and of the handsome structures erected in our great capitals. In addition to the well-known museums in London, the palatial buildings in Edinburgh, Cardiff, Dublin, Glasgow, Liverpool, Birmingham, and others are an indication of the importance attached to the value of museums in these places. Many other cities and towns have buildings of large size and great importance. From the experiences of members of the Museums Association, however, I feel I am not exaggerating when I state that a visit to one of these institutions is a tremendous strain, both mentally and physically, and one wonders whether the greatest possible benefit is obtained from an attempt to examine the extensive and magnificent collections exhibited.

I remember as a boy spending my holidays in London, within easy access of the National History Museum in South Kensington, where day after day I carefully examined case after case in gallery after gallery in that great building, returning from my 'holiday' with anything but beneficial physical results. I still remember how tired I was in walking round and round the galleries, and even felt a sigh of relief when a fog caused them to be cleared and I had to sit on a seat outside waiting for the fog to lift.

Unquestionably these great storehouses of treasures are of considerable advantage to the student and to the specialist alike, and it is obviously desirable that in our great museums efforts should be made to have the collections as complete as possible; but it is doubtful whether, from the point of view of the general public, greater benefit is derived from a tour round one of these national institutions, than from an examination of somewhat smaller buildings, such as, for example, those occurring in the city in which you are now assembled.

I am assured over and over again by individuals and parties examining one or other of our museums in Hull, that each contains just sufficient to keep the interest going during the visit without undue fatigue, and that much more information is consequently obtained and digested than usually results from a lengthy visit to a larger institution.

Another aspect of this question must not be lost sight of. We have in this country, time after time, to deplore the loss

* Extract from the Presidential Address to the Museums Association, delivered at Hull, printed in extenso in *The Museums Journal* for August.

of some important historical building either by neglect, indifference, or the desire for 'improvements,' real or imaginary. An instance occurred quite recently when some of the powers that be in Croydon endeavoured to raze to the ground the Whitgift Hospital, for the purpose of widening the road. Fortunately, the House of Lords had more power and forethought than some of the people of Croydon, and the building still exists. Even in our own city, street improvements have resulted in the disappearance of buildings which many of us would have had preserved. I have in mind particularly a fine 15th century hostel, known as the King's Head, in High Street, which some years ago was offered to the city as a free gift in the hope that it might be removed to one of the parks, or other suitable locality. I believe the estimated cost of its removal was considered to be too great, and the whole structure was demolished; fortunately I was able to obtain the carved oak brackets, cornices, and other moveable portions, and have preserved them. The oak beams supporting the roof, etc., supplied the material for our cases in the Wilberforce Museum. Without expressing an opinion as to whether the demolition of this property has really improved the thoroughfare in which it was situated, the disappearance of one of our oldest buildings is certainly to be regretted.

Those who are visiting Denmark shortly will ascertain that there, as in Sweden and numerous other countries abroad, for many years it has been a practice to preserve buildings of this description, and the well-known Open-Air Museums so admirably described by a predecessor of mine in this Chair, Dr. Bather, are a great attraction as well as of considerable scientific and historical value. Through the efforts of the National Trust, and the Ancient Monuments Committee, many fine buildings are now being preserved for all time, but, unfortunately, the press almost daily records the destruction of beautiful and valuable structures, the loss of which will certainly be resented by future generations. The idea of converting such buildings into museums, therefore, has a two-fold advantage, first, that of preserving them, and, second, that of exhibiting within them objects which are suitable to their surroundings. During the past quarter of a century it has been my privilege, as well as that of many here present, to visit places of this description, and it is very gratifying to gather from the pages of *The Museums Journal* that the number of comparatively small buildings of this character which are being transformed into museums is on the increase annually.

During our Conferences I have in mind the visits we have paid to the Hall i' th' Wood Museum, at Bolton, in which Mr. W. H. Lever took so keen an interest, and contains many

memorials of G. Crompton, who here invented the spinning-machine known as the 'mule.' This magnificent half-timbered house is fitted up, as far as possible, with objects relating to the period it represents, or to Crompton, who once worked within its walls.

When at Maidstone, we saw the Christ Church Mansion, a magnificent building in which exhibits were chosen so as to be appropriate. Following the example of Hull, our Bradford friends secured Bolling Hall, and have placed therein various objects relating to Yorkshire folk-lore, with the result that this particular museum has become exceedingly popular to Bradfordians, and to visitors to that city. During our Norwich Conference we were shown how an old castle could admirably be adapted to the purposes of a museum, and through the energies of the late James Reeve, followed by the work of our colleague, Mr. F. Leney, we have been privileged to see many jewels in this beautiful setting. We were then permitted to examine the collections formed by Mr. L. G. Bolingbroke in the fine old house known as The Strangers' Hall, and it is pleasing to record that Mr. Bolingbroke had handed this building and its contents over to the Corporation of Norwich for preservation for all time,* the ceremony having taken place quite recently.

Sheffield, in addition to its well-known Mappin Art Gallery and Museum, possesses the Ruskin Museum, which illustrates the artistic temperament of the man whose name it bears.

Some years ago I* was instrumental in advising the Doncaster Corporation as to the best method of transforming the Beechfield Estate Mansion into a museum, and probably largely from the fact that it was possible to make public exhibition galleries in this old house, the building and its gardens are now available to the Doncaster public.

In many of our counties, old castles are preserved by being transformed into archaeological or other museums; such an example, for instance, occurs in Lewes Castle, where the Sussex Archaeological Society exhibits its collections. The Keep at Newcastle-on-Tyne is another. Rushen Castle, in the Isle of Man, was formerly the home of the historical relics of that island, and even during the past few months in the neighbouring township of Bridlington, the fine old stone Bayle Gate, a fortified entrance to the grounds once surrounding Bridlington Priory, has been transformed into a local museum, and with the aid of an enthusiastic committee, who take duties alternately as Honorary Guides, this old structure forms a still further attraction to our holiday resort.

*An illustrated description of this occurs in *The Connoisseur* for June, 1923.

On the other hand, buildings, if not so ancient, but more pretentious, are cared for in a similar way. I have in mind the exceedingly palatial Bowes Museum in Barnard Castle; the well-known Wallace and Sloane Collections in London, and others.

Recent press notices inform us of the additions made to Towneley Hall, Burnley, where an art museum now exists in beautiful surroundings; and Mr. Deas has just sent me a pamphlet suggesting that the mansion in Ashbourne Park, lately bequeathed to Sunderland, should be a museum of Local Industries and Antiquities. There is also a scheme for the preservation of a 14th century building called the Marlepins, in Sussex, which I saw recently; this would serve the purpose of a good local museum.

At Carlisle, as Mr. Hope has informed us, Tullie House is the centre of many valuable Roman remains and other relics found in that district, while similarly at the eastern extremity of the Roman Wall, at Chesters, are more extensive collections demonstrating the importance of the achievements of the rulers of this country nearly two thousand years ago.

In going through the *Museums Directory*, issued by this Association in 1911, an enormous number of similar instances are recorded, and since its publication I am delighted to report that many valuable structures have their preservation assured from the fact that they have been utilised as museums of archæology, geology, or of art.

One of the most humble, but none the less interesting, of these is the Brabazon Gallery at Sedlescombe, Sussex, which is an early thatched tithe barn, and within its small rooms are exhibited the work of Hercules Brabazon, a local artist; and objects relating to the early history of that village. We have an old tithe barn in this district, which I am hoping may shortly be preserved in a similar way.*

This desire, which certainly exists in various parts of the country, for the preservation of ancient buildings, and for utilising them for educational purposes, is growing, and speaks well for the interest taken in educational matters generally. It is also pleasing to think that through the public-spirited action of private individuals and corporations, preservation of many architectural gems is now assured.

In his address to this Association at Oxford, Sir Ray Lankester stated: 'Most museums in this country have such a peculiar ancient history, are subject to the government of such strangely ignorant boards or committees, are so ill-supplied with funds, and so completely misunderstood or else

* At Easington. This has since been handed over to the Corporation of Hull.

neglected by the community in the midst of which they are placed, that it is impossible for their curators or directors to do more than supply in a fragmentary way the admirable principles of Brown Goode and Flower, however warmly we may believe in them.'

This state of things may have existed then, in fact it possibly exists to-day in more than one locality. I cannot admit, however, that it is so in Hull. The people of Hull, rich and poor alike, have proved the extent of the appreciation of museums and art galleries, and if I have a complaint to make against my own committee, it is not that the members are ignorant, it is that they know too much !

I now look forward to your next visit to Hull, when, if I am present, and some of my dreams come true, I hope to be able to show you that Hull is indeed 'the Place of the Small Museums.'

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PROCEEDINGS OF SCIENTIFIC SOCIETIES.

D. E. Connor's Presidential Address, 'Gleanings about Trees,' and Reports on Field Meetings, with notes on the Botanical work of the year, appear in the *Proceedings of the Liverpool Naturalists' Field Club* for 1922.

We have received from Mr. Richard W. Goulding, F.S.A., a pamphlet, reprinted from the *Transactions of the Thoroton Society*, on Gervase Holles, the antiquary. Mr. Goulding has taken some trouble in the identification of various portraits of the Holles family.

B. N. Blood contributed 'Notes on Trichogrammatinae taken around Bristol,' and J. W. Tutchter 'Some Recent Exposures of the Lias (Sinemurian and Hettangian) and Rhaetic about Keynsham,' in the *Annual Report and Proceedings of the Bristol Naturalists' Society*.

A Catalogue of the Roman Coins in the Chester Museum, by the Rev. J. T. Davies and Mr. F. W. Longbottom, appears in *The Journal of the Architectural, Archæological and Historic Society of Chester*, recently issued. Judging from the references to rare coins which have 'disappeared,' this catalogue seems necessary.

Among the contents of *The Journal of the Northants Natural History Society and Field Club*, Vol. XXI., we notice:—'The Northampton Sand of Northamptonshire,' by Beeby Thompson; 'The Evolution of British Breeds of Cattle,' by W. A. Stewart; 'Prehistoric Cattle in Northamptonshire,' and 'A Relay Earthquake in Northamptonshire.'

The London Naturalist is the title given to the Journal of the London Natural History Society for the year 1922 (Hall 40, Winchester House, Old Broad Street, E.C.2., 42 pp., 3/-). The publication contains E. B. Bishop's Presidential Address on 'The Extreme "Localness" of Certain Species'; as well as Reports of the Archæological, Botanical, Lepidoptera, Ornithological, Plant Gall Sections, and that of the Chingford Branch.

The Proceedings of the Spelæological Society of the University of Bristol, Part 3, of Volume 1, published at 2/-, are available, and contain an excellent record of the work accomplished by this enthusiastic Society. There is a Report on Aveline's Hole, with a list of species identified by E. T. Newton, F.R.S., A Report on the Human Teeth, by E. K. Tratman, etc., and several papers bearing upon the caves of the area and their contents.

YORKSHIRE NATURALISTS IN UPPER NIDDERDALE.

W. H. PEARSALL, D.SC., F.L.S., AND F. A. MASON, F.R.M.S.

THE 307th meeting of the Yorkshire Naturalists' Union was held on June 16th at Middlesmoor. Owing to the train service, those members who attended for the day only had limited opportunity of examining this delightful district, but good results were obtained in the valley of the How Stean Beck. An early meeting was held at Headquarters, Mr. W. H. Burrell, F.L.S., being in the chair, and the following reports were presented. A vote of thanks was passed to the Bradford Corporation for permission to visit their estates in the neighbourhood, and to Mr. Riley Fortune for making the local arrangements. Two new members were elected.

GEOLOGY (R. G. S. Hudson) :—Thanks to Mr. L. H. Tonks, of H.M. Geological Survey, the geologists of the Yorkshire Naturalists' Union had a most interesting day at Angram and Limley. By the kind permission of the Resident Engineer of the Bradford Corporation, Mr. Tonks was able to show us the sections of the Millstone Grit and Yoredales that have been opened up in the course of the construction of a dam for the new Bradford reservoir.

Attention was mainly paid to three points. The nature of the junction of the Millstone Grit with the Yoredale series, the horizons of the Yoredalian beneath the Millstone Grit at Scar House, Limley and Lofthouse, and the varying lithological facies of the Yoredale series when compared with the same horizon to the west and north-west.

Clean sections of the Millstone Grit enabled us to see the passage of a grit of the coarse pebbly variety into a very fine grit not distinguishable from the grits of the Yoredale series. The thickening and thinning out of the grits were well seen, 'washouts' were marked, and altogether the sections were very instructive from the point of view of conditions of sedimentation. The junction of the Millstone Grit and the Yoredales was plainly marked, there being no suggestion of a passage from the one to the other. The irregular base of the shale, the lowest bed of the Grit, was very noticeable when compared with the regular bedded shales of the Yoredales just below, the suggestion being rather that of an unconformable junction.

No fossils of zonal importance were found in the underlying shales and limestones of the Yoredales, but comparison with Limley suggested the correlation of this horizon with that of the Scar Limestone in Teesdale and the Middle Limestone of Wensleydale and Wharfedale. The normal facies of this horizon is one of limestone with rare interbedded shales. Here this same horizon is one of shale with thin limestone showing as in other districts, the change of facies of the Yoredalian from west to east is from a limestone to a shale with limestones.

At Limley, below a similar series of limestone and shales, lower horizons are exposed. The bed immediately below contains fossils characteristic of the Cockle Shell Limestone of Teesdale and the middle horizon of the Middle Limestone of Wensleydale and Wharfedale. The Millstone Grit conditions come in much earlier here than elsewhere in the North of England or, as is more probable, there is a definite unconformity of the Millstone Grit on the Yoredalian with the Grit resting here on beds as low as anywhere.

BOTANY (W. H. Pearsall) :—Most time was spent by the botanical members of the party in How Stean Gill. This gill cuts down first through the grits, and subsequently through the limestones. Both parts have approximately the same slope and degree of shelter, and so an opportunity is afforded of directly comparing the gill woodlands on these dissimilar

types of rocks. Counts of the trees shewed that on the limestone the usual Elm wood occurred (with 80% Elm), the subordinate trees being Ash (6%), Sycamore and *Pyrus aucuparia* (4% each), sessile oak and yew (about 1% each). There was much less *Prunus padus* than is usually found in these woods. On the grits, *Quercus sessilis* made up rather more than 30% of the trees, and there was about 15% of each of the following: Sycamore, Ash, *Pyrus aucuparia* and *Betula pubescens*. *Prunus padus*, *Alnus* and *Salix caprea* also occurred. Felling seemed to increase the proportions of Birch and Ash.

The ground flora of the woods was very mixed throughout. The limestone types were either chiefly *Mercurialis* and *Allium ursinum* or else a mixture in which *Geranium Robertianum*, *Oxalis*, *Cardamine flexuosa*, *Crepis paludosa*, *Porotrichum dendroides*, *Hypnum commutatum* and *Chrysosplenium alternifolium* were often noticeable.

In the grit woods, the ground flora was chiefly *Holcus mollis*—*Deschampsia flexuosa*, with or without *Pteridium*, or a community of ferns—*Mnium hornum* and *Scilla nutans*. The ferns included the Male and Lady Ferns, the Beech, Oak and Hard Ferns.

Neither of the woods is floristically rich, but they are fairly representative of the two main types of gill woodlands.

BRYOLOGY (W. H. Burrell):—Upper Nidderdale has been worked for Mosses and Liverworts in the past by R. Barnes and Ll. J. Cocks, their records being published in *The Naturalist*, 1897 and 1915. No new species have been reported for this visit, but several rarities were seen in their old stations. The moors being on millstone grit and the waters very soft, the general flora of the dale is calcifuge; exceptionally fine mats of *Hypnum stramineum* were noted; *Sphagnum rufescens*, *S. recurvum*, *S. cymbifolium* and *S. papillosum*, *Dicranella squarrosa*, *Racomitrium aciculare*, *Brachythecium plumosum*, *Hyocomium flagellare*, *Marsipella emarginata* and *Gymnocolea inflata*, formed massive vegetation in swamps and on wet rocks and *Tetraphis Browniana* was seen in the upper parts of Blayshaw Gill. Between Middlesmoor and Lofthouse a change of type occurs; in the stream beds calcifuge mosses remain dominant; grit boulders and siliceous rocks of the Yoredale series are heavily festooned with *Racomitrium aciculare* and *Brachythecium plumosum*; but the steep slopes of the valley there were in strong contrast with the rest of Nidderdale; *Weisia verticillata*, *Barbula revoluta*, *Encalypta streptocarpa*, *Barbula rubella*, *Hypnum commutatum* and *H. molluscum* were conspicuous and *Seligeria tristicha* and *Pedinophyllum interruptum* were amongst the rarer plants seen. *Hypnum Patientiæ* was found on a field path near How Stean Beck.

MYCOLOGY (F. A. Mason): Although the number of species recorded on this excursion was small, it was due rather to the restricted time at disposal for collecting than to a paucity of fungi, and the district would repay closer investigation than was possible in a short day. The species listed below were met with along the banks of How Stean Beck.

<i>Peronospora Valerianæ</i> Trail.	<i>Puccinia major</i> Dietel., on <i>Crepis</i>
<i>P. Violæ</i> De By.	<i>paludosa</i>
<i>P. Schleideni</i> Unger.	<i>P. Hieracii</i> Mart.
<i>Uromyces Valerianæ</i> Fckl.	<i>P. Chrysosplenii</i> Grev.
<i>U. flectens</i> Lagerh.	<i>P. Caricis</i> Reb.
<i>U. Alchemillæ</i> Lev.	<i>P. oblongata</i> Wint.
<i>U. Ficariæ</i> Lev.	<i>P. Winteriana</i> Magn.
<i>U. Acetosi</i> Schröt.	<i>Podosphæra leucotricha</i> Salmon (con-
<i>U. Scillarum</i> Wint.	idial stage only, <i>Oidium farin-</i>
<i>Puccinia Centaureæ</i> D.C.	osum Cke., on <i>Pyrus Aucuparia</i>
<i>P. obtegans</i> B. et Br.	<i>Sphærotheca pannosa</i> Lev.
<i>P. Lapsanæ</i> Fckl.	<i>Melanomma pulvis</i> — <i>pyrius</i> Fckl.
<i>P. Hypochæridis</i> Oud.	<i>Mycosphærella Fragariæ</i> (Tul.)
<i>P. Chondrillæ</i> Corda.	<i>Diatrype stigma</i> Fr. [Johan

An uncommon Pyrenomycete, *Diatrypella aspera* (Fr.) Nke., *certe* H. C. Hawley, occurred on *Prunus Padus*. This species has only once previously been recorded in the county, at Scarborough (see Fung. Fl. Yorks. '05).

The occurrence of *Exoascus Pruni* Fckl. on *Prunus padus* is noteworthy. This fungus is an injurious parasite which produces the disease of cultivated plums known as 'Bladder-plums,' or 'Plum-pockets.' The mycelium lives in the flower buds and later affects the ovaries, which, instead of developing into perfect fruits, become swollen and otherwise distorted, and spongy. In these circumstances a stone fails to develop, the aborted fruit assuming the form of an elongated hollow bag—hence the common name of the disease. There is an unpublished note on the occurrence of this species in Yorkshire, Mid. W., in the records of the Leeds Naturalists' Club, diseased fruits having been found in abundance at Ling Ghyll, in 1920, by Chris. A. Cheetham.

Among the few, mostly common, agarics seen during the day were *Pholiota præcox* collected by W. H. Burrell and *Stropharia inuncta*, collected by Greevz Fysher.

The only Mycetozoa met with were *Lycogala epidendrum* and *Reticularia Lycoperdon*, both species being handed in by Mr. Burrell.

COLEOPTERA (A. E. Winter):—The following species were noticed, chiefly in Raysgill:—

Leistus rufescens.

L. fulvibarbis.

Nebria gyllenhali.

N. brevicollis.

Elaphrus cupreus.

E. riparius.

Clivina fossor.

Bembidion dentellum.

B. atrocoeruleum.

Pterostichus anthracinus.

Agonum ruficorne.

A. marginatum.

Dianous coerulescens.

MOLLUSCA (Greevz Fysher): Very few Mollusca were observed on the occasion of the Excursion to Middlesmoor. Mr. Taylor verifies the following list:—

Limnæa truncatula.

Hygromia rufescens.

Hyalinia cellaria.

Hyalinia nitidulus.

Zua lubrica.

L. truncatula, which the writer has not so very frequently observed, is fairly abundant on the mud at the shallow end of Gollthwaite Reservoir.

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The Ferns (Filicales). Vol. I.—Analytical examination of the criteria of Comparison, by **F. O. Bower**. London: Cambridge University Press, 359 pp., 30/- net. Few people are better qualified to deal with this difficult subject than Professor Bower, and in the present volume, by the aid of enormous numbers of beautiful illustrations, many original, he discusses the various aspects of the Fern, its life-history, habits, leaf structure, cellular construction, spore-producing organs and so on. In seventeen chapters he gives an admirable review of the subject, and unquestionably this will remain the standard book for a considerable time to come. The first part of the work has been to recognise, to describe in detail, and evaluate the several criteria which are most suitable for use in the comparative treatment of the Class: by comparison of the fossil remains to check the several features and their details according to such evidence of their time of appearance as the successive geological ages will afford: and so, partly by comparison of living forms and partly by the more direct record of the Earth's crust, to arrive at a sound basis for the phyletic grouping of the Class. And in the second part it remains to apply the method to reconstructing the phylesis of the Filicales from the ample, but nevertheless fragmentary, facts available.

THE MUSEUMS ASSOCIATION AT HULL.

THE Annual Meeting of the Museums Association, held at Hull from July 9th to 13th, was a very successful one. There was a record attendance, 133 members and delegates being present. The papers dealt with many aspects of museum activity. On Tuesday morning Mr. T. Sheppard, M.Sc., the Curator of the Museums, Hull, gave his Presidential Address on 'The Place of the Small Museum,' extempore. This was followed by a paper by Dr. North, of the National Museum of Wales, on 'Some Methods of Mounting Geological Specimens'; Dr. Woodhead, of Huddersfield, spoke on 'Reparations and Museums'; and Dr. W. F. P. McLintock, of the Jermyn Street Museum, London, on 'Gemstones in Museums Collections.'

Wednesday's programme started with an interesting discussion on the Presidential Address, which was succeeded by the reports of the three committees appointed last year at Leicester. Mr. E. R. Dibdin delivered the report of the Circulating Art Committee, which had succeeded in getting together a fine collection of pictures, representative of the best artists, suitable for circulation to provincial galleries. Since the idea was originally mooted at Leicester, it was felt to be appropriate that the collection should be exhibited there first, and the exhibition has since been opened by Mr. E. R. Dibdin, chairman of the committee. It is attracting keen interest, and has been enthusiastically commented upon in the press.

The Secretary, Dr. Jas. J. Simpson, M.A., submitted the report of the Cements Committee, and Mr. E. R. Dibdin the report of the Preservation of Pictures Committee, both of which had done excellent work during the year; one of the welcome subsidiary results of the work of the Cements Committee was the addition of a sum of money to the funds of the Association.

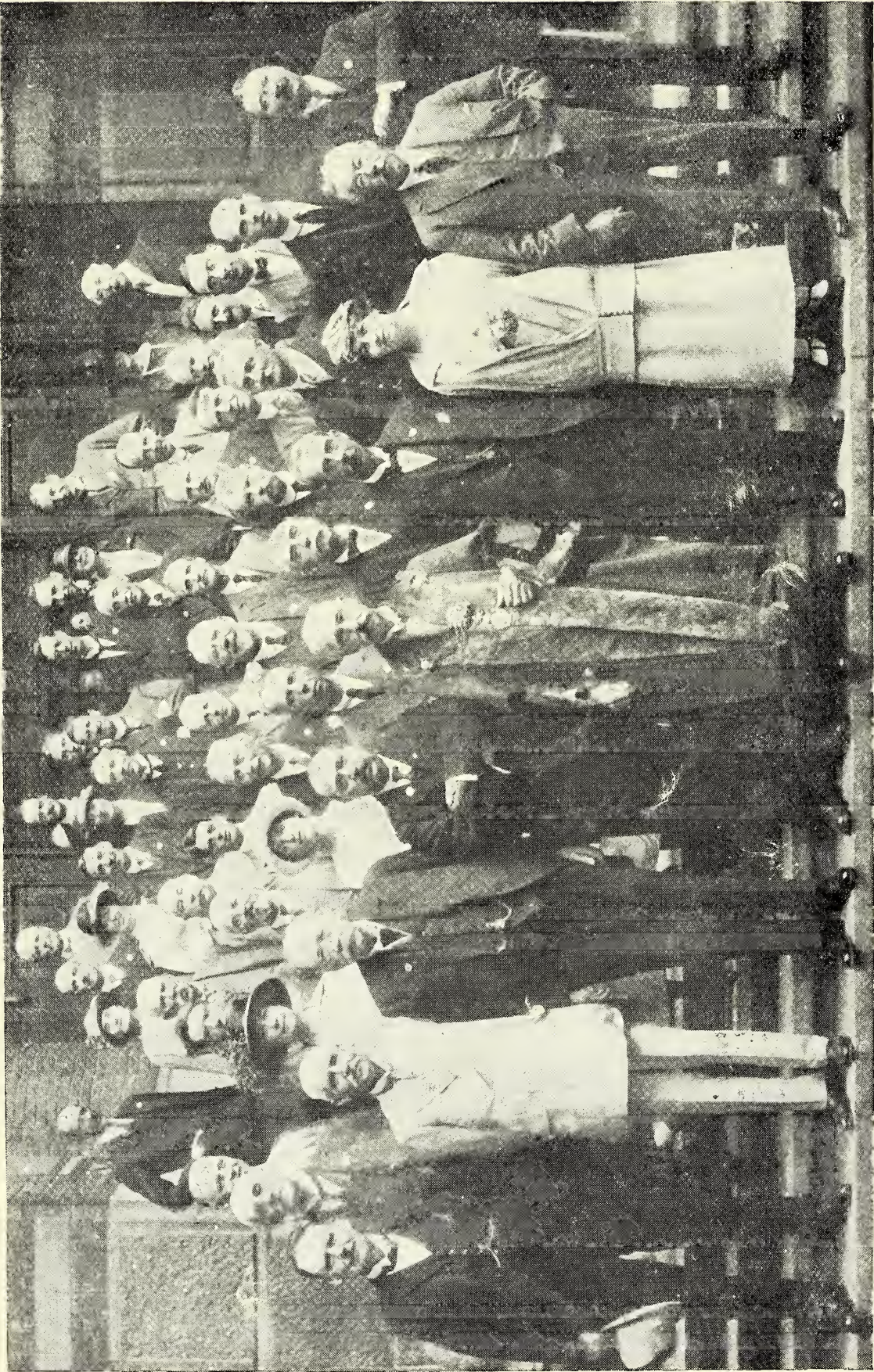
On Thursday there were papers by Dr. Simpson and Mr. C. Matheson, M.A., B.Sc., both of the National Museum of Wales, dealing respectively with economic exhibits in that museum, and methods of arranging fish-exhibits, while Mr. J. Ritchie, of Perth, described a way of retaining the colours of specimens preserved in fluid. The Annual Business Meeting followed, and Dr. Bolton, of Bristol, was appointed President for the ensuing year.

An interesting description by Mr. G. H. Sherwood, Executive Secretary of the American Museum of Natural History, New York, of the educational work carried on by that institution, was the first item on Friday; the address was illustrated by coloured lantern slides. Mr. T. C. F. Brotchie, of Glasgow, then exhibited a cinematograph film dealing with the Art Gallery at Kelvingrove, and discussed the question of 'Civic Body and Art.'

Visits were paid to the various museums in Hull during the week. The President outlined the origin and purposes of each, besides giving interesting information about particular exhibits. The Wilberforce Historical Museum, the Museum of Fisheries and Shipping, and the Museum in Albion Street were all inspected; on Thursday afternoon the party visited the Trinity House and its Museum, where Captain Tether gave a most interesting account of the history of the Trinity House and the good work it was doing. The visitors were impressed by the number and variety of these museums, and especially, perhaps, by the setting of the Museum of Fisheries and Shipping in the beautiful grounds of Pickering Park. On Tuesday afternoon a visit was paid to the Minster and to St. Mary's Church at Beverley; the President acted as guide, and the members partook of afternoon tea by kind invitation of the Mayor, Alderman Gates.

Several firms manufacturing museum equipment had exhibits on view at the Albion Street Museum, and these were inspected by the members. This is a feature which it would be well to extend, as it gives curators an opportunity of examining the latest apparatus designed for museum use.

The social side of the Conference was well in evidence, and the City of Hull had made most generous arrangements for entertaining the Association. On Tuesday evening the Lord Mayor and Lady Mayoress held a reception at the Guildhall; it was devoid of formality, and was thoroughly enjoyed by all present. The Corporation Plate and Regalia, which include many interesting pieces, were placed on exhibition, and each visitor was supplied with a list of these, compiled by Mr. Sheppard, and containing information as to the history of the various articles. On Tuesday, also, the members and delegates were the guests at lunch of the Hull Luncheon Club, when the President delivered a racy address on 'The Evolution of a Yorkshireman,' hinting that the natives of Yorkshire derive most of their qualities from Scotsmen and the Vikings. On Wednesday the members were invited to lunch by the Local Reception Committee, and in the afternoon, during the visit to the Wilberforce Historical Museum, tea was provided through the kindness of Alderman P. T. Crook, J.P., Chairman of the Museums Committee. To Alderman Crook and Mr. James Downs, J.P., and the other members of the Local Committee, the members owe a deep debt of gratitude. On Thursday, an excessively hot day, the members were very grateful for the tea served by the thoughtful arrangements of the Trinity House authorities. A conversazione was held on the Thursday evening by the Local Committee at the Albion Street Museum. The Association's Annual Dinner was held on Wednesday evening, when those who had taken a prominent



The Museums Association at Copenhagen.

part in the arrangements for the success of the meeting were invited as guests. The dinner, by unanimous agreement of the assembled 'savages,' was voted a great success.

The little aluminium 'booklets' distributed to each member, containing the programme, menus, and other items of interest, and pictures of the Hull Museums, will be kept by all as attractive mementoes of a most enjoyable visit. The handbook to Hull and the East Riding, a copy of which was given to every member of the party, contains a wealth of varied information, and will prove of permanent value as a book of reference. By the kindness of the Corporation Tramways Committee, all those wearing the Member's Badge, which was provided by the local committee, were entitled to travel free of charge on the tramcars. By courtesy of the Chairman of the Tramways Committee special cars were provided to convey the members to Pickering Park on Thursday afternoon.

The Hull part of the Conference ended on Friday, when the party visited the Roman, Mediæval, and Modern Buildings in the ground of the Yorkshire Philosophical Society, and were entertained to tea by invitation of the Society. The members found the pamphlet kindly provided by the Society very useful in their study of the buildings and grounds.

The meeting was one of the most successful held for a long time, and the members and delegates will long remember the kindness shown them by the citizens of Hull, which has made that city, as Miss Frost expressed it at the Annual Dinner, 'the city of the comfortable conference.'

On Saturday, forty members of the party left Hull for Copenhagen, when an extension of the Conference was held.—
C. MATHESON.

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DANISH MUSEUMS.

(PLATE IV.).

At the close of the Conference of the Museums Association at Hull, forty delegates, representing various museums in England, Scotland, Ireland and Wales, paid a visit to Denmark. The party included the President, Mr. T. Sheppard, M.Sc.; Secretary, Dr. J. J. Simpson; Local Secretary, Mr. James Downs, J.P.; and the Lord Mayor of Hull (Councillor Raine), and other members of the Hull City Council. They left Immingham by the 'City of Paris' on Saturday, July 14th, and arrived at Gothenburg on Monday morning. Copenhagen was reached late on Monday evening, by train, the members being picked up by the 'City of Paris' at Copenhagen on Monday, the 23rd, reaching England on Friday, the 27th, *via* Christiania.

A local committee in Denmark, with Dr. Mackeprang, of

the Danish National Museum as Chairman, and Mr. Slomann of the Museum of Decorative Arts, as Secretary, prepared a programme which accounted for almost every moment from the Reception at the National Museum at 10-30 on Tuesday to the official farewell dinner on Sunday evening, which was held in the Nimb Restaurant, overlooking the Tivoli Gardens.

At Gothenburg time was allowed to visit the great exhibition, but, unfortunately, our arrival was accompanied by a tremendous downpour of rain, and the particular part of the docks where the vessel was berthed seemed to be 'far away from anywhere,' and even the aid of a Police Station, where English was not spoken, did not enable the party to make any progress. Eventually taxi-cabs were secured, and the exhibition was reached. As our particular group included Art Gallery Curators and an eminent artist, our time was devoted to examining that section of the Exhibition occupied by representations of the present and 'future' art of Norway, Sweden and Denmark. For this a supplementary charge was made, and, though a small one, was resented.

We believe Britain took the lead in exhibiting, and thus encouraging the product of the New Futurist, Cubist, Jazz, or whatever other description may be given to the extraordinary productions issued; and just as small-pox may be a comparatively mild complaint in this country, but when taken to a district where it has been previously unknown, becomes virulent, dangerous and even deadly—so the epidemic of futurist pictures which originated in England has spread to the nearer Continental countries with results that staggered even those familiar with British examples.

We can only congratulate the exhibition authorities in having secured sufficient material with which to frame the enormous quantity of canvases sent in, and on having sufficient wall space upon which to place them.

During the week the number of museums, castles, royal palaces, cathedrals and places of historical interest visited—ranging from prehistoric dolmens to a super-decorated palace of the nineteenth century—was almost incredible, but was possible by fleets of motor cars, kindly placed at the disposal of the delegates, from early morning till late evening. Everywhere were the warmest of welcomes, the Union Jack flying on the important buildings in honour of the visitors: similarly, miniature British flags were mingled with Danish at all the 'Smørrebrøds,' (lunches) and dinners, which were lavishly given.

Although the delegates stated they had rarely been as hospitably entertained as at the Hull Conference, it was hardly expected that this should have been kept up. It was, however, if not actually exceeded, during the Danish visit.

After an address of welcome and a general introduction, Tuesday morning was spent in an examination of the wonderfully complete series of prehistoric objects found in Denmark and preserved in the National Museum. The law which exists that all finds are the property of the nation is of great assistance to the museum. Lunch in typical Danish fashion was provided in the museum grounds, where the party had the attention of a whole army of photographers. The afternoon was spent in the famous Rosenborg Castle, where is preserved the jewellery, silver, gold plate and regalia of the various Danish kings. Here Mr. Lüsburg acted as guide. Later the delegates were officially received at the new town hall, and were provided with tea and agreeably cool drinks.

On Wednesday the party was shown over the ruins of castles of various periods, which are preserved in situ under the new Parliamentary building at Copenhagen. This occupies a permanent position in the centre of the city, and has always taken a prominent part in the various historical events. Later the Museum of Decorative Arts was examined under the guidance of the Director, Mr. Slomann. The contents of this building will shortly be removed to a new museum which is being erected, and the Director was congratulated upon the wealth of valuable material under his charge. Smørrebrød was kindly provided in the building.

In the afternoon the Hirschsprungs collection of Danish paintings was examined and explained by the Director. In this case a wealthy and discriminating collector had gathered together a representative series of paintings by all the principal Danish artists, together with the furniture and other personal relics relating to the painters. The collection was presented, complete, together with the magnificent building—specially designed—in which the exhibits are placed. As no additions are to be made to the collection, an exceptional opportunity occurred of classifying the pictures, and of this full use had been made.

On this date one section of the party visited the Zoological Museum, and also the palatial Mineralogical Museum, where lunch was provided. Dr. Petersen then took the members on the Biological Station's ship, the 'Japetus Stenstrup,' and with the aid of a dredge, gave a demonstration on 'The Animal Communities on the Sea Bottom in the Sound.'

Thursday was a day long to be remembered from the extraordinary amount of ground covered and the number of places visited—the party starting at 8-30 a.m. by motor cars and reaching home late at night—every moment being fully occupied. First the wonderful open-air museum at Lyngby was visited. Here the various old cottages, tithe-barns, wind-mills, and other buildings—all suitably furnished—were in-

spected under the guidance of Mr. Uldell and Miss Mygdal. From thence the party visited Elsinore, where Kronborg Castle, famous for its association with Hamlet, was examined. Here the delegates were received by the Commander of the Castle, and had the privilege of lunching in one of the rooms.

One section of the Castle has been set apart recently as a Museum of Shipping, where a collection of objects very reminiscent of the Pickering Museum at Hull has been gathered together under the direction of Mr. E. F. S. Lund. A strong feature of the museum was the illustrations of the Battle of Copenhagen.

Leaving the Castle the party travelled *via* Fredensborg to Hillerod, where the National Historical Museum at Frederiksborg Castle was visited. The wealth of architectural detail exhibited in this charming moated castle will long be remembered, as will the recital of 17th century music on the magnificent 17th century organ in an elaborately decorated chapel of the same period. One of the large rooms in this castle, where the scheme of decoration seemed to have run riot, was only shown to us under pressure, as our Danish friends were not too proud of the gaudy effects produced. The members were then entertained to dinner in the castle, and arrived home at a late hour, having covered over a hundred kilometres.

On Friday the members assembled at the State's Art Museum (National Gallery), which, as might be expected, contains a remarkable collection, fully occupying every moment the delegates had at their disposal. Here again the members had the privilege of having Smørrebrød. The afternoon was occupied in visiting the wonderful Ethnographical Collections in the National Museums, the National Collections of Coins and medals, and the Greek and Roman Antiquities, the party in each case being conducted round by the officials in charge, who gave descriptions in excellent English.

On Friday evening the Association had the privilege of entertaining to dinner the various local ladies and gentlemen who had so ably assisted in connection with the excursion. This was held at a pleasantly situated hotel on the sea-shore at Scotsburg. The guests included Dr., Mrs. and Miss Mackeprang, Mr. Slomann, Mr. Lüsburg, Mr. and Mrs. Jacobsen, Dr. Beckett, and others. An opportunity was taken of making a presentation to the daughter of our principal host, Miss Mackeprang, who was shortly to be married.

Saturday the 21st was another full day, the members visited Roskilde, where is the well-known 12th century cathedral containing the royal tombs of the kings and queens of Denmark, and many fine buildings, including several examples of early brickwork. Lunch was held in the Traegaarden. Cars were then requisitioned, and the famous sepulchral chamber or

dolmen at Æm was visited, the mound in which it occurred being a prominent feature in the landscape, and in the fields surrounding we were able to obtain quite a number of interesting flint scrapers, flakes, and of the curious notched implements precisely similar to those found on the sites of the Neolithic workshops in Bridlington, figured and described in *The Naturalist* for Aug., 1910, page 293. Both the texture of the flint and the form of the implements from Æm bore an extraordinary resemblance to the East Yorkshire examples.

From here the party visited the Park and Chapel of Ledreborg Castle.

On Sunday, as Dr. Mackeprang pointed out, the best had been saved until the last. Thorvaldsen's Museum was first visited and here is an enormous building, specially designed, and forming a suitable shrine for the extraordinarily large series of fine sculptures, the work of Denmark's greatest artist. In this case each of the important pieces had a room to itself, and the arrangement of the group of statuary and the method of lighting, etc., were greatly admired.

But even the charm and beauty of this specially arranged collection was by far eclipsed by the palatial surroundings of the collections of art and antiquity in the Ny Carlsberg Glyptoteket. In this instance a wealthy and discriminating collector of valuable works of art of all ages and nations handed the results of his labours over to his country, together with a sufficiently large sum of money to erect a worthy home for the collections, and also endowed them in such a way that they should be amply cared for for all time. In this enormous building the method of arrangement and exhibition of the specimens far exceeds anything that the visitors had previously seen in any country, whole rooms being devoted to a few small gems, the decoration of walls, floors, ceilings, etc., varying in each room, and being so arranged as to harmonise with the nature of the exhibits. From the ample space given to each specimen, and from the method of its exhibition, labelling, etc., it was possible to occupy a considerable time in going through these galleries, every moment being pleasantly occupied without any trace of the fatigue usually experienced in examining museums and galleries.

As a further example of the thoroughness with which our Danish friends looked after the interests of their visitors, on the Sunday evening a magnificent banquet was given to the delegates in the Nimb Restaurant, overlooking the grounds of the Tivoli, the entertainment continuing until midnight, when the fireworks in these famous gardens concluded a most brilliant day.

In accordance with the Danish custom the Toast List was not prepared, and members spoke 'as the spirit (or spirits !)

moved them,' but notwithstanding this, the sincere expressions of welcome on the part of the hosts, and those of thanks on the part of the visitors, will long be remembered by those who had the privilege of being present.

Even early on the following morning, when the 'City of Paris' sailed from Copenhagen, Dr. Mackeprang and Mr. Slomann were present on the quay to bid farewell, and Miss Mackeprang brought handsome bouquets of flowers for the lady members of the party.

Unquestionably the gathering in Denmark has done much to cement the friendship between the scientific savants in the two countries, and if, as was frequently expressed, it results in each taking more interest in the arts and sciences of the other, much good will have resulted.—T.S.

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CONGRESS OF THE ROYAL SANITARY INSTITUTE AT HULL,

30TH JULY TO 4TH AUGUST, 1923.

CONSIDERABLE interest has been manifested in the proceedings of the 34th Annual Congress of the Royal Sanitary Institute, held this year in Hull. The attendance of members, delegates, etc., approximated 1000, and at the School of Art, where the Reception Room was situated, the accommodation for meetings was taxed to its utmost. Among those attending were representatives from the U.S.A., Bombay, Australia, New Zealand, South Africa, Nova Scotia, Zanzibar, Czecho-Slovakia, Poland, Greece, Brazil and Mexico, as well as leading men from the medical and scientific world.

The President of the Congress, the Rt. Hon. T. R. Ferens, P.C., J.P., made reference in his Inaugural Address to the most acute problems at present occupying the attention of sanitary administrators, viz., housing, tuberculosis, cancer, etc., and also expressed the opinion that money spent on sanitary improvements was an economy.

The Congress Lecture was given by Sir Alexander Houston, K.B.E., on 'A Pure Water Supply'; and the Popular Lecture to the general public was contributed by B. Seeborn Rowntree, Esq., J.P., on 'Industry and National Welfare.'

The Sectional and Conference meetings dealt with a wide range of subjects of scientific and popular interest. Of course, public health was the predominant note of the discussions. Dr. Raeburn, the Tuberculosis Medical Officer for Hull, speaking in relation to tuberculosis, said that large employers of labour should arrange for their workers to be systematically examined for signs of the disease; and on the same subject, Dr. Percy Hall, of Hull, thought our susceptibility was assisted by the fact that we ate too much preserved food. 'God sent the

food,' he remarked, 'and the devil the saucepan.' Dr. Cawadias of Athens, thought the present wave of optimism in regard to tuberculosis was unjustified.

The Lord Mayor of Hull, who was President of the Section for Representatives of Sanitary Authorities, referred to the problem of slum dwellings; and other speakers commented on the Small-pox Vaccination question. Professor J. B. Cohen, of Leeds University, dealt with 'The Smoke Cure,' and condemned the open kitchen range.

Papers on the Cancer question evoked much discussion, Dr. A. T. Brand, of Driffield, advocating the segregation of those affected. Col. Freemantle, M.P., who is connected with the British Empire Cancer Research Campaign, was of opinion that everybody should be medically examined once every five years.

Valuable and instructive papers were also read in relation to port sanitation and seamen's unclean diseases; labour-saving in the home; birth control; meat inspection; food poisoning; midwifery and the work of the health visitor; the rat as a disease carrier; and numerous other subjects of medical and sanitary importance.

The papers and discussions were eminently topical, and covered all public health subjects foremost in question to-day.

On the social and entertainment side, the Local Committee had made preparations on a generous scale for the comfort and well-being of the visitors. Hull's inadequate hotel accommodation was supplemented by a first-class apartment list; free travelling on the tramcars was arranged for members; visits were organized to some of the world-famed Works and Factories in and around Hull, as well as special facilities being given to view the Hull Museums, Wilberforce House, the Trinity House, etc.

Each member was also presented with a copy of the 'Handbook to Hull and the East Riding of Yorkshire.' This is a valuable publication on the history of Hull and district, with information as to geological formation, flora and fauna, etc. One of its most noteworthy contributors was the late Sir Albert K. Rollit, himself at one time a citizen of Hull. The book is edited by Mr. T. Sheppard, M.Sc., the curator of the Hull Museums. High appreciation of the Local Committee's choice of the Handbook was expressed by the Congress members.

Other visits and excursions included a trip on the River Humber to Spurn, during which Major General Sir Geo. K. Scott-Moncrieff, K.C.B., K.C.M.G., C.I.E., described the fortifications which he himself designed for the protection of the Humber during the War. In addition, interesting information was given by Mr. T. Sheppard, regarding the lost towns of the Humber. Fine weather favoured the trip, which was declared to have been most enjoyable and instructive. It was without doubt the premier item in the Excursions Programme.

An excursion to Bridlington was also arranged, and upwards of 200 members availed themselves of the opportunity of seeing this breezy and attractive seaside resort, and of visiting the old Priory Church. Hospitality was provided by the Mayor of Bridlington. Dr. P. Hall and Dr. J. Wright Mason were the local guides for this excursion.

Another very popular excursion was that to the old world minster town of Beverley. A party of 100 members, under the guidance of Mr. T. Sheppard, thoroughly enjoyed the visit to St. Mary's Parish Church, the North Bar and the Minster. The Mayor of Beverley received the members at the Guildhall and provided afternoon tea.

The Reception at the City Hall, Hull, given by the Lord Mayor and Lady Mayoress to the members of the Congress and others, presented a brilliant and animated spectacle. The beautiful hall was tastefully decorated, and music—vocal, from the great organ, and from an orchestra—added to the enjoyment of the evening. The City Art Gallery, which adjoins the Hall, was thrown open to the guests, and Hull's art treasures, thus displayed, aroused much admiration and appreciative comment.

One afternoon was devoted to a Garden Party in the Hymers College grounds. The Hull City Police Band provided music, and an interesting wireless demonstration was arranged. A cricket match between teams representing the Royal Sanitary Institute and the Hymers College added to the attractions of the afternoon.

The Health Exhibition, organized by the Royal Sanitary Institute in connection with the Congress, was held in the Wenlock Barracks, and proved an unqualified success. In addition to the trade exhibits, the Hull Corporation was represented by exhibits from the Health and Port Sanitary Departments, the City Engineer's and the Museums Departments,

The Congress throughout was declared to be a most successful one, and the Local Committee received much laudation upon the efficient arrangements they had made. The excellence of the programme of visits and excursions was freely remarked upon, and the visitors were lavish in their praise of the hospitality and courtesousness they had met with in Hull. A feature interesting to Hull residents was the surprise expressed by those visiting the city for the first time at the noble buildings, well-kept roads and boulevards, efficient municipal services, etc., which they had observed.

The Rt. Hon. the Lord Mayor of Hull (Councillor C. Raine, J.P.), was the chairman of the Local Committee, and the Local Honorary Secretaries were H. A. Learoyd, Esq., M.A., LL.B., Town Clerk, and Dr. J. Wright Mason, M.B.E., Medical Officer of Health.—J.C.

NEWS FROM THE MAGAZINES.

L. M. Parsons writes on 'Dolomites' in *The Quarry* for July.

C. B. Moffat has a note on 'The Food of the Irish Squirrel' in *The Irish Naturalist* for August.

'Brickmaking in the Midlands,' by R. C. S. Walters, is the title of a paper in *Discovery* for August.

C. E. N. Bromehead contributes 'The Oil Horizons of England' to *The Geological Magazine* for July.

British Birds for July has an account of 'Some British Birds in the Fourteenth Century,' by N. F. Ticehurst.

'Prehistoric Bridlington' is the title of a paper by T. Sheppard in *The History Teachers' Miscellany* (Norwich).

H. B. Williams contributes 'Preliminary Observations on the British Vanessids,' in *The Entomologist's Record* for August.

The Misses Baxter and Rintoul contribute their Report on Scottish Ornithology for 1922 to *The Scottish Naturalist*, No. 137.

Mr. G. T. Porritt records a large female *Bombyx quercus* with male coloration, in *The Entomologist's Monthly Magazine* for August.

'An Appreciation of the late W. H. Pearson, M.Sc., A.L.S.' appears in No. 5 of the present volume of *The Lancashire and Cheshire Naturalist*.

J. D. Dean has 'Observations on the Land Mollusca of the Coasts bordering on the Bristol Channel' in *The Journal of Conchology* for July.

Nature, No. 2800, has much to say in connection with the group of Museum buildings at South Kensington, and the need for their extension.

G. L. R. Hancock writes 'On Some Hibernating Ichneumonidæ from the Cambridgeshire Fens,' in *The Entomologist's Monthly Magazine*, No. 710.

In *British Birds* for August, Mr. H. S. Gladstone gives a list of seventeenth century names for some British birds, and H. M. Wallis describes recent changes in the birds of Scilly.

Nature, No. 2801, has a supplement on 'The Structure of the Atom,' by Professor N. Bohr, and No. 2802 has a supplement dealing with 'Muscular Exercise,' by Professor A. V. Hill.

F. E. Clements writes on 'The Ecological Method of Teaching Botany,' W. Stiles on 'Permeability,' and R. Snow on 'An Apiocarpic Plant of the Red Campion' in *The New Phytologist* for July.

H. R. P. Collett refers to Some Interesting Hemiptera-Heteroptera in Cheshire, and H. Britten gives Additions to the List of Hemiptera in Lancashire and Cheshire, in *The Lancashire and Cheshire Naturalist*, Vol. 15, No. 6.

The Museums Journal for August contains Mr. T. Sheppard's Presidential Address to the Museums Association at Hull, on 'The Place of the Small Museum,' and an Obituary notice of the late Sri Henry Howorth. There is the portrait of the President as frontispiece.

Among the contents of *The Wiltshire Archæological and Natural History Magazine* for June, we notice a paper on 'Excavations in Silbury Hill,' by Professor Sir William Flinders Petrie; and one on 'Romano-British Villages,' by Lt.-Col. Hawley. The magazine also contains the usual wealth of records relating to natural history and other discoveries.

Among the contents of *The Edinburgh Review*, No. 485 (Longmans, Green & Co., 208 pp., 7/6) we notice 'The Biological Foundations of Human Character,' by Sir F. W. Mott; and 'Climatic Changes and Continental Drift,' by Prof. J. W. Gregory. Professor Gregory's article is a general review of four publications issued between 1915 and 1922, viz. (1) 'Civilization and Climate,' by E. Huntington, 1915; (2) 'Climate Changes: their Nature and Causes,' by E. Huntington and Stephen S. Visher, 1922; (3) 'The Evolution of Climate,' by C. E. P. Brooks, 1922; (4) 'Die Entstehung der Kontinente und Ozeane,' by Dr. A. Wegener, 1922.

NORTHERN NEWS.

The death is announced of Canon W. W. Fowler, author of 'The Coleoptera of the British Islands.'

President Henry Fairfield Osborn favours us with a copy of his valuable paper, 'The American Museum Ideal.'

The Preliminary Programme for the Liverpool Meeting of the British Association, September 12th to 19th, has been issued.

The death is announced of R. W. Hooley, of Winchester, who was particularly interested in the Geology of the Isle of Wight.

Part 12 of Hutchinson's *Animals of All Countries* will particularly appeal to Museum Curators from the wealth of illustration it contains relating to various species of deer.

Mr. H. B. Booth sends us an envelope, the stamp upon which has been defaced by the Postal Authorities of British Columbia by the words 'Protect the birds and help the crops.'

We have been favoured with a copy of the Presidential Address delivered at the Anniversary Meeting of the Geological Society of London by Professor A. C. Seward, F.R.S. It is entitled 'The Earlier Records of Plant-Life.'

Sir Herbert George Fordham favours us with a copy of his paper 'Note sur la Liaison entre la Cartobibliographie et l'Histoire,' reprinted from the Bulletin de la Societe Royal Belge de Geographie, No. 1, 1923, in which he refers to various memoirs dealing with the maps of this country.

The numbers of *The Pageant of Nature* which have recently been published keep up the standard of excellence as regards the illustration of botanical and zoological subjects, upon which the editor, Dr. P. Chalmers Mitchell, and the publishers, Messrs. Cassell and Company, are to be congratulated.

C. W. Colthrup writes on the 'Variation of the Nesting Habits of the Ringed Plover' to part 10; J. J. Ward contributes 'Saw-fly Marvels: The palisade builder and the sycamore jumper'; and Richard Kearton the 'Kittiwake and Black-headed Gulls,' among many other papers, to Part 11 of *The Pageant of Nature*.

After a break owing to the war, the Doncaster Art Gallery and Museum is continuing its Annual Report, that for 1922 having recently been issued. It contains particulars of many interesting local additions made to the collections during the year. We notice that particular attention is being paid to Bygones.

Those who heard the charming address given to the Museums Association at Hull recently, 'On Collecting Gemstones,' by Dr. W. F. P. McIntock, will be glad to avail themselves of the new edition of the Guide to the Collection of Gemstones in the Museum of Practical Geology, which Dr. McIntock has prepared. Though it contains eighty pages, with several illustrations, it is sold at the low price of one shilling.

From our contributor, Mr. T. Petch, we have received 'Interim Notes on Entomogenous Fungi,' and 'Studies in Entomogenous Fungi: The Genera *Hypocrella* and *Aschersonia*,' reprinted from *The Annals of the Royal Botanic Gardens, Padadeniya*; and 'Studies in Entomogenous Fungi,' and Presidential Address: 'Fungi Parasitic on Scale Insects,' reprinted from *The Transactions of the British Mycological Society*.

From the University Press of Liverpool we have received 'A Comparison of British and American Foundry Practice with special reference to the Use of Refractory Sands,' by Dr. P. G. H. Boswell (106 pp., 4/6). Dr. Boswell's practical experiences with American foundry work, together with his knowledge of English methods, peculiarly qualifies him for the preparation of this Report, much of which was written during 1919, but for various reasons the completed work has been delayed. There is a mass of information relating to the Composition of Sands, Methods of testing, Properties of the Bond, etc.

HANDBOOK TO HULL AND THE EAST RIDING OF YORKSHIRE

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A Monthly Journal of General Irish Natural History.

BOTANY.

ZOOLOGY.

GEOLOGY.

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C. B. MOFFAT, B.A., and R. J. WELCH, M.R.I.A.

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A MONTHLY ILLUSTRATED JOURNAL
PRINCIPALLY FOR THE NORTH OF ENGLAND.

EDITED BY

T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;

AND

T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield,

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

G. T. PORRITT, F.L.S., F.E.S.

JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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☆ OCT 1 2 1923 ☆

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YORKSHIRE NATURALISTS' UNION.

BOTANICAL SECTION.

MEETING October 6th, at 3 p.m., in the Botanical Dept., Leeds University, to discuss the Report and suggest Officers for 1924.

The following papers will be read in the evening :—

- 'The Anatomy of Peat Plants,' by J. H. Priestley and Mildred Hinchliff.
- 'Experimental Study of Moorland Peat,' by Dr. W. H. Pearsall.
- 'Notes on the Structure of Aquatic Plants,' by J. H. Priestley and Evelyn Ford.
- 'The development of the Potato Tuber,' by J. H. Priestley and Elsie Whitfield.

C. A. CHEETHAM.

GEOLOGICAL SECTION.

President : Prof. A. GILLIGAN.

The ANNUAL MEETING of the Section will be held in the Geological Department of the Leeds University, on Saturday, October 13th, at 3 p.m.

Members and Associates are invited to bring notes, specimens, etc., and to take part in the discussions.

JOHN HOLMES (*Hon. Sec.*),
Crosshills, nr. Keighley.

ANNUAL MEETING OF THE ENTOMOLOGICAL SECTION.

President :—G. T. PORRITT, Esq., F.Z.S., F.E.S.

Two meetings will be held in the Leeds City Museum, Park Row, on Saturday, **October 20th**, 1923, viz., at **3-15 p.m.**, to consider and pass the Sectional Reports and to elect Officers for 1924, and at **6 p.m.**, at which entomological topics will be discussed. Exhibits of all orders of insects are requested. Notes and records made during the season on entomological subjects in the county may be read at the meeting or previously sent to one or other of the secretaries for inclusion in the Annual Report of the Union.

Secretaries.—LEPIDOPTERA : B. Morley, Skelmanthorpe ; HYMENOPTERA : Rosse Butterfield, Keighley ; DIPTERA : C. A. Cheetham, Old Farnley, Leeds ; HEMIPTERA : Dr. W. J. Fordham, Gateshead ; COLEOPTERA : M. L. Thompson, Middlesboro' ; NEUROPTERA, ORTHOPTERA AND TRICHOPTERA, G. T. Porritt, Huddersfield.

Sectional Secretary,

B. MORLEY, Skelmanthorpe.

BRYOLOGICAL SECTION.

A day's excursion will take place on November 17th to Grassington. Members prepared to stop the week-end are asked to make their own arrangements. Further details later.

F. E. MILSOM, *Hon. Sec.*,
High Cross, Kirkburton,
Huddersfield.

NOTES AND COMMENTS.

A GENEROUS GIFT.

Our readers will be pleased to learn that our old friend and contributor, Mr. W. N. Cheesman, J.P., has handed a cheque for a hundred guineas to the Yorkshire Naturalists' Union, to be applied to providing additional illustrations for *The Naturalist*.

LANCASHIRE AND CHESHIRE ENTOMOLOGISTS.

We have received the *Forty-fifth and Forty-sixth Reports of the Lancashire and Cheshire Entomological Society*, bound together (64+16 pp., 3s.). The frontispiece contains a portrait of our contributor, Mr. Wm. Mansbridge. The report of the Council is exceedingly encouraging, and the record of the proceedings of the Society (as also indicated from our pages from time to time) is evidence of the enthusiasm of its members. In addition to much information of a general character, there are the following important papers:— 'Parasitic Wasps and Bees,' by H. M. Hallett; 'Moths and Myths,' by J. W. Griffin; 'Notes from a Cheshire Garden,' by F. M. B. Carr; 'A preliminary list of the Aphididæ of North Wales,' by F. V. Theobald and C. L. Walton; and a continuation of the Lepidoptera List.

BRITISH BRYOLOGISTS.

We have received Vol. I., Part 1, *Report for 1923 of the British Bryological Society*, the General Secretary of which is Mr. D. A. Jones, of Rock House, Harlech, North Wales. This new society is the result of the amalgamation of the two sections of the Moss Exchange Club. The present report contains 42 pages of closely printed records of the distribution of Mosses and Hepatics of the British Islands, which should be in the hands of every student of these interesting groups. In addition, F. Rilstone gives a Report of Distributor (Mosses); A. Wilson, a similar report on the Hepatics; the remainder of the pamphlet being occupied by details of Sphagna, True Mosses, and Hepatics, and obituary notices of W. H. Pearson and W. Ingham.

AMMONITE TYPES.

Part XLI. of Buckman's *Type Ammonites* completes Vol. IV. of this well-known work, and from some general remarks made therein we gather that 'The illustrations of Ammonites which have been given in the four volumes of this work are intended not only for the use of the specialist, but for the assistance of any student of Mollusca seeking to identify the specimens in his collection. For this reason there has been given in each case, at the top of the legend footing each plate, the name which the species has borne in literature, or, failing

that, the name which it has received in public or private collections, or, failing that, the name which has or might have been applied to it by the field-geologist. Therefore, if the student is aware of the name which has hitherto been applied, even in a general way, to the specimen which he is seeking to determine, he can look up that name in the index, and will find references to the plates which have been given of the species bearing that name. Thus, instead of aimlessly turning over plates, only to become more and more bewildered by a seemingly endless array of forms, the student can, if he works methodically, bring the number of plates, which



it is necessary for him to consult, within quite reasonable limits.'

AMMONITES GULIELMI.

Among the many specimens figured are two Yorkshire examples, one of which we figure herewith. It is labelled '*Ammonites gulielmi* "South Cave, Yorkshire; Kellaways Rock," siliceous, ironshot. Mr. Frank Petch Coll.; S. 27, 40, 27.5; 54, 39, 33, 31.5 Max. c. 58; venter runcinate, feebly bordered, no round stage. CATASIGALOCERAS PLANICERCLUS, nov. Macrocephalitan, *Catacephalites*; Genotype, Holotype. Cf. CXCIV.'

'EXPERTS' ON A CART HORSE.

In connection with some discoveries near the Marble Arch, London, the *Daily Mail* for August 25th figured the greater part of a jaw of a cart horse. This was described as 'The Mystery Jaw Bone, believed to be that of a prehistoric animal, found near Marble Arch, W., as to the exact origin of which even the experts cannot agree.' From an article accompanying this, we are again informed that 'the experts who have examined it are unable to give a definite opinion upon it.'

It would be interesting to know the names of the 'experts' who cannot recognise the jaw of a cart horse when they see it. From the same source we learn that 'The workmen have found a horse-shoe of the flat, wide kind used by the Romans, a Roman stirrup made of iron, and the bolt of a chariot-wheel.' We have not seen these objects, but we are prepared to wager that they have nothing whatever to do with the Roman period, and are comparatively modern in date.

BRITISH ASSOCIATION AT LIVERPOOL.

The ninety-first meeting of the British Association for the Advancement of Science was well attended, there being nearly 3300 present, about the same number as at the last Liverpool meeting, and the third largest meeting in the history of the Association. Professor Sir Ernest Rutherford, for the first time in the history of the Association, had the platform practically to himself during his address, as he required it for a screen to illustrate his lecture; another innovation was the fact that his speech was broadcasted. This necessitated his remarks being much more slow and deliberate than would otherwise have been the case, with the result that his address, though given extempore, was not completed, though printed copies were available in the Reception Room.

THE HANDBOOK.

Under the head of 'Merseyside,' a handbook of 340 pages was presented to each member of the Association, and in this 'an attempt has been made to present a survey of Merseyside in its various aspects, Municipal, Industrial and Scientific, rather than to dwell on Liverpool and its immediate environs.' Among the thirty chapters, those most likely to interest our readers were:—'Regional Survey, and Physiographical Features, and Geology,' by W. Hewitt; 'History and Antiquities,' by R. Gladstone; 'Public Museums,' by J. A. Clubb; 'Botany,' by E. H. Rideout, J. A. Wheldon and W. G. Travis; 'Entomology,' by W. E. Sharp, W. Mansbridge, J. R. le B. Tomlin and R. Newstead; 'Vertebrate Fauna,' by T. A. Coward; and 'Marine Biology of the Irish Sea,' by J. Johnstone. In addition, a similar cloth-bound volume of 120 pages with map was issued giving particulars of excursions and visits to works. This side of the Association's work was particularly prominent, so much so that many late comers were disappointed.

'THE ADVANCEMENT OF SCIENCE.'

Under this title, the Association has issued the Presidential Address on 'The Electrical Structure of Matter,' by Professor Sir Ernest Rutherford, and the following Sectional Addresses: Section A (Mathematics), 'The Origin of Spectra,' by Prof.

J. C. McLennan ; B (Chemistry), 'The Physical Chemistry of Interfaces,' by Prof. F. G. Donnan ; C (Geology), 'Evolutional Palæontology,' by Dr. Gertrude Elles ; D (Zoology), 'Modern Zoology,' by Prof. J. H. Ashworth ; E (Geography), 'The Geographical Position of the British Empire,' by Dr. Vaughan Cornish ; F (Economics), 'Population and Unemployment,' by Sir William H. Beveridge ; G (Engineering), 'Transport and its Indebtedness to Science,' by Sir Henry Fowler ; H (Anthropology), 'Egypt as a Field for Anthropological Research,' by Prof. P. E. Newberry ; I (Physiology), 'Symbiosis in Animals and Plants,' by Prof. G. H. F. Nuttall ; J (Psychology), 'Mental Differences between Individuals,' by Dr. C. Burt ; K (Botany), 'The Present Position of Botany,' by A. G. Tansley ; L (Education), 'The Education of the People,' by Prof. T. P. Nunn ; M (Agriculture), 'Science and the Agricultural Crisis,' by Dr. C. Crowther. The volume is published by John Murray, at 6s., and will be handy for those who do not care to wait for the complete record of the Proceedings which will appear next year.

RECENT GEOGRAPHY OF LIVERPOOL.

Sir Aubrey Strahan opened an appropriate discussion on 'The Geography of the Liverpool District from Pre-Glacial Times to the Present,' at the commencement of the work of Section C (following on Prof. Boswell's Lecture on 'The Geology of the Area'). Sir Aubrey stated 'the estuaries of the Mersey and the Dee form the outstanding features of the Liverpool district. Indeed, the comparatively recent development of Liverpool as a port and business centre, and its outstripping of the ancient city of Chester, have been determined by the nature of the estuaries on which they are respectively situated ; yet, for some reason not now obvious, the Dee attracted the Romans while the Mersey was ignored. It becomes of interest, therefore, to inquire whether there is any geological evidence of change in the character of the estuaries which will account for the shift of commercial centre. That the estuary of the Dee has existed in approximately the same position since early Pleistocene times is highly probable, for borings have revealed the fact that Boulder Clay extends far below sea-level under parts of it. It appears, however, that the post-Glacial estuary does not exactly coincide with that which existed before the Glacial Period, and that the pre-Glacial course of the river after it left the Welsh hills was not recovered after the ice retreated. The changes in the upper reaches have been investigated by Mr. L. J. Wills. Lower down at Holt, Alford and Chester, the pre-Glacial course was so blanketed by Boulder Clay that the river cut a new course, partly in solid rock. A depressed

area ranging through Pulford, Kinnerton, and Dodleston, presumably marks the site of the buried valley, and leads to a tract on the south side of the modern estuary, where Boulder Clay has been found to extend to a great depth below sea-level.

GLACIAL CONDITIONS.

Similar changes seem to have been forced upon the Mersey as a result of glacial conditions. One diversion near Runcorn was made known by Mellard Reade, who showed that the pre-Glacial course ran north of Westbank under Ditton Marsh. He was led to anticipate that a pre-Glacial channel would be encountered in the Mersey Tunnel, as proved to be the case. In several other places also along the present course of the river great depths of Boulder Clay, sometimes far below sea-level, were recorded by him and others. It would not be safe, however, to assume that all the cases of deep drift are referable to the pre-Glacial channel of either the Mersey or the Dee. The soft Triassic rocks were deeply scored, and yielded vast quantities of the material which was carried southwards to form the glacial drift of Cheshire; shallow rock basins, as well as river channels, may lie buried beneath the glacial drift.

RECENT CHANGES.

Mr. C. B. Travis followed with a paper on 'Recent Geological Changes on the Northern Shore of the Mersey Estuary.' In this he pointed out that 'the area described forms part of the South Lancashire coast on the north-eastern side of Liverpool Bay, between Waterloo and Hightown. This tract of coast, about four miles in length, consists superficially of Blown Sand, which in places rises in dunes to elevations of 30 to 50 feet. The sand lies on a platform of post-Glacial deposits, which are well exposed on the foreshore in a fine section about a mile in length and 50 yards in breadth. These deposits consist of the "Upper Peat and Forest Bed," underlain by Grey Sands and Silts, which rest in turn on unexposed Boulder Clay. The bedrock, which has not been exposed along the coast has been proved in borings to consist of an undulating surface of Keuper Marl, while inland at a short distance Keuper Sandstone outcrops. The River Alt breaks through the sandhills at Hightown, and flows along the shore in a southerly direction, falling into the Victoria Channel at Crosby.'

MARINE EROSION.

'During the past ten years marine erosion has been very active along this coast, and the sandhills between Crosby and Hightown have suffered severely. This is due to tidal action and to changes in position of the River Alt on the foreshore, leading to a considerable lowering of the level

of the beach. The Peat and Forest Beds and associated sediments are being rapidly fretted away, while the dunes have been cut back to a maximum distance of 85 yards within eight years. This wasting of the coast has caused the destruction of valuable residential property, and has become a serious local menace. Owing to a landward swing of the Alt the wide expanse of sandy shore formerly exposed at low tide is no longer available as a source of supply to the marginal dunes, which have been strongly denuded and in places levelled during heavy gales. To the south, towards Waterloo, however, erosion diminishes with the recession of high-water mark from the margin of the land and the seaward bend of the Alt, and a marked accretion of sand is now taking place. A comparison of old maps and charts with the latest Ordnance Survey shows the changes which have taken place in the form of this part of the coast in the last three centuries, an important example of accretion being furnished by the development of the sand-dune salient of Formby Point, while in later times a broad tract of duneland, forming the Altcar Rifle Range, has been built up by artificial means in less than a century.

BUNTER SANDSTONES.

Still bearing on the geology of the district around Liverpool, Mr. T. A. Jones gave an account of the Middle Bunter Sandstones of the Liverpool District and their Pebbles. He states that ' of the various divisions of the Triassic sandstones, the middle series of the Bunter, generally known as the Pebble Beds, is most in evidence in the neighbourhood of Liverpool. They cover a large part of the Wirral Peninsula, where their thickness has been estimated at from 750 to 950 feet, and underlie the greater portion of the City of Liverpool and its suburbs, where the maximum thickness reaches 1200 feet. They form hard, massive beds of a predominantly red or brown colour, varied by bands of grey, and have furnished the principal building stone of the district. Cross bedding is frequently seen, and marl bands several feet thick are of common but irregular occurrence. In the almost complete absence of fossils from the Liverpool Trias, interest is largely confined to questions relating to the origin of the material constituting the sandstones and the methods of its transport and accumulation. On these points a study of the pebbles which occur in great number and variety in the Middle Bunter beds affords one of the most promising directions in which to seek for definite information. The pebbles are distributed in a very sporadic manner, and include in greatest number quartzites and grits of many kinds, with a small proportion of granites, felstones, and a very interesting group of metamorphic rocks characterised by the presence of

tourmaline in many forms. The igneous rocks also are mostly schorlaceous, and in one granite pebble garnets were found in addition. The constant presence of tourmaline naturally suggests that the metamorphic rocks, together with the felstones, may all be related as contact rocks of the same intrusive mass, of which the schorlaceous granite pebbles may possibly be marginal samples. These pebbles resemble very closely those of the Bunter beds of the Midlands as described by Professor Bonney.'

A SOUTHERN ORIGIN.

'Fossiliferous pebbles are extremely rare, but one obscure specimen seems to indicate that the Ordovician quartzites found in the Midlands and at Budleigh Salterton may not be entirely absent. As these quartzites contain fossils which have never been found in the Ordovician sediments of the British Isles, but which occur abundantly in the *Gres de May* of Normandy, a southern origin of some portion at least of the Bunter deposits is suggested, notwithstanding that, following Professor Bonney, the majority of the quartzites are generally regarded as of northern origin. Support is lent to this view by the fact that the tourmaline-bearing pebbles, on the whole, seem to be most readily matched from outcrops still found in the south and south-west of England. Whatever theory is adopted the great variety of the pebbles, no less than the enormous volume of the deposits, demands an extensive area of supply, and there is evidence of the existence at the dawn of the period of land masses extending on the west from north to south, where metamorphic rocks of the kind required, or conglomerates and breccias containing them, may have been exposed to denudation. From widely separated parts of this region torrents and rivers in flood may have carried down fragments and scattered them as pebbles over the sandy eastern plains.'

RE-ADJUSTMENTS.

Prof. P. F. Kendall followed with a paper on 'Quaternary Isostatic Re-adjustments in N.W. Europe.' He pointed out that 'Jamieson's theory of Isostasy formulated to explain the raised beaches and submerged forest of Scotland has been applied in detail to Scandinavia and parts of North America, but some implications fully recognised by him have not been specifically adopted. When an area is depressed by overloading a wave of sub-crust material must be generated which travels outwards, producing a transient elevation. When the loaded area is again unloaded a return-wave travels inward. The latter alone has been recognised, *e.g.* by Upham, Gilbert, Brögger, and de Geer. In both movements there appears to

be considerable lag. The advance of the Scandinavian ice-sheet upon the Yorkshire coast was preceded by an uplift whereby the coast-line was deserted by the sea—perhaps for a prolonged period. Depression ensued at a later stage, represented by the Kirmington deposits and perhaps by the much disturbed Burstwick Gravels. Post-glacial movements have restored the land levels to their pre-glacial position. In Scotland, though similar effects were most probably produced, they have been masked by the deformations due to native ice-loads. The isostatic recovery of Scotland deformed the strand-lines, though not to so marked a degree, nor in so clear a fashion as in Scandinavia, yet the effects are well seen, *e.g.* on the shores of the Forth. Scandinavia furnishes a clear example of the lagging of the isostatic recovery and its wave-like progression. Brögger has shown that during the retreat of the ice-margin from the Outer to the Inner Ra depression was continuing, though the ice-load was diminishing. Simultaneously the wave of recovery was advancing across Denmark. In Upham's monograph on Lake Agassiz it is shown that the recovery was delayed until the ice-margin had retired for a distance of 250 miles. The movements in the North Sea Basin seem to lend no support to de la Mothe's speculations—they were diastrophic, not eustatic—with the doubtful exception of that recorded in our submerged forests. In the interpretation of the records it is necessary to take account of the effect of the closure of the North Sea by the ice-sheet, whereby a condition with regard to salinity would be produced comparable to that of the Baltic. This would explain the estuarine character of the faunas.'

BRITISH ROCK-SALT DEPOSITS.

On this subject Dr. R. L. Sherlock reported that 'British Rock-salt deposits are confined to the New Red rocks. Two areas are recognised: a Western District containing the deposits of Cheshire, Lancashire, Isle of Man, North Ireland, Staffordshire, Worcestershire, and Somerset; an Eastern District comprising Co. Durham and Yorkshire. In the Western District the rock-salt is in the Keuper Marl; in the Eastern District its age has been a matter of controversy, and it is described by different authors as Keuper or Permian. In the Western District there are frequently two beds of salt separated by a band of marl, as in Cheshire, Lancashire, North Ireland, Staffordshire, and Worcestershire. This leads to the conclusion that the two salt beds in these counties are contemporaneous, as probably are those of the Isle of Man and Somerset, where, however, the two beds have not been recognised. The Cheshire deposits occur in a Top and Bottom Bed separated by from 20 to 45 feet of marl. The Top Bed

is from about 30 to 90 feet thick, and the Bottom Bed from about 60 to 91 feet, the Top Bed being the more variable. This is in part owing to subsequent denudation. A recent investigation indicates that the salt-field is much more extensive than had been supposed, covering an area of about 375 square miles. In the Eastern District there are also two beds of salt, but both are present in only a few places. Comparing different borings it is apparent that the main (upper) salt-bed at Middlesbrough is in the 'Upper Permian Marl' of Nottinghamshire, and the lower one in the "Middle Permian Marl" of that county. It has however, been shown that the so-called Permian of Nottinghamshire passes laterally into Trias northwards, and it is believed that there is no Permian System in Britain. The horizons of these salt-beds are lower than those of the Western District, and they have probably a different origin. The Eastern deposits are associated with gypsum, anhydrite, and dolomite, whereas in the Western District only secondary gypsum is known. It is inferred that, while the Eastern salts were deposited in the (Zechstein) sea, the Western salts originated in lakes in a desert, at a somewhat later period.'

PERMIAN ROCKS OF SKILLAW CLOUGH.

Miss M. Workman stated that 'Outcrops of Lower Permian rocks occur at Bispham, near Ormskirk, in Skillaw Clough, and also along Bentley Brook. The Millstone Grit described for comparison is found in Skillaw Clough, and forming a ridge of hills behind Parbold; its junction with the Permian is probably unconformable. In Skillaw Clough the Magnesian Limestone overlies purple-red fossiliferous marls resting on soft bright-red and hard brown sandstone; in Bentley Brook purple-red fine sandstone with shale bands is found above the Magnesian Limestone, which in turn overlies interbedded compact purple-red shales and sandstones. The cementing material is calcite with dark-red limonite. The "heavy" minerals include pyrite, magnetite, garnet, zircon, rutile, anatase, xenotime(?), tourmaline, ilmenite, hæmatite, hypersthene, muscovite, epidote, chlorite, and monazite. The shale sandstones and grits of the Millstone Grit series contain the following "heavy" minerals: Pyrite, garnet, zircon, xenotime(?), rutile, tourmaline, ilmenite (and other iron ores), hypersthene, topaz, muscovite, chlorite, and monazite. This assemblage is very similar to that found in the Millstone Grit of Leeds by Dr. Gilligan, as well as to that of the Lower Permian of West Lancashire. There is also a great similarity between the latter and other Permian, whether found east of the Pennines or in Devonshire. As to derivation—the condition of the quartz, felspar, and garnets, and the presence

of monazite indicate that the materials of the Permian came principally from the Millstone Grit which had a northern origin. Some basic or ultra-basic rocks, probably of the Highland complex, must have furnished the hypersthene, epidote, and chlorite. The rocks were apparently laid down in an arid climate on the shores of an inland sea which afterwards covered them.'

TECTONICS OF THE LANCASHIRE COALFIELD.

Prof. G. Hickling gave 'some conclusions resulting from a study of the South Lancashire Coalfield (excluding the Burnley basin) by means of a precise contoured plan showing the present configuration of the surface of one stratum, the Trencherbone coal-seam. The Coal Measures attain a thickness of over 7500 feet in the eastern part of the field, and show a striking westerly thinning to about 3500 feet near Prescott. The greater part of this reduction is due to the dwindling of the Upper Coal Measures, in which both actual thinning of the measures (with loss of coal) and overlap by the Permian and Trias play a part. The Middle Coal Measures diminish from 3500 feet on the east to 2000 feet on the west. The coal-seams are brought nearer together by the reduction of the intervening strata, but little coal is lost. On the other hand, the area of Middle Coal Measures south of Bolton and Bury is remarkable for the failure of the lower seams (below the Cannel). The Lower Coal Measures are believed to be fairly constant, with a thickness of about 1500 feet. The Coal Measures in this area are covered by (3) Bunter Sandstones; (2) Permian Marls with Limestones; (1) Collyhurst (? Permian) Sandstones. The Collyhurst Sandstones are mainly confined to the area around Manchester and Stockport, and their rapid and irregular variation in thickness (from 0 to 1500 feet) within that area is only intelligible on the supposition that they are separated from the overlying Permian Marls by a strong unconformity. They appear to be separated from the Coal Measures below by a further unconformity. There is no definite evidence in this area of unconformity between the Bunter and the Permian Marls. The Lancashire Coalfield occupies the N.E. angle of the rhomb-shaped "Cheshire basin," which may be regarded as bounded by the Ribble anticlines (N.E.-S.W.) on the north-west the Audley anticline (N.E.-S.W.) on the south-east, the Pennine elevation on the east, and the Clwydian elevation on the west. The basin was probably subdivided in pre-Triassic by an E.-W. elevation passing a little south of Macclesfield and Chester, while the northern part of the basin is further subdivided by the Rossendale anticline (E.-W.), cutting off the Burnley basin, with the Knowsley anticline (N.E.-S.W.),

which continues it to the south-west. A minor anticline of the N.E.-S.W. series modified the eastern side of the basin near Stockport. The Lancashire Coalfield is probably separated from the Flint Coalfield by the N.-S. anticline which passes near Prescot, and which is probably continued under the Triassic cover to the south.'

RHYTHMIC CHANGE IN THE PLANKTON.

Under this heading Prof. James Johnstone gave 'an account of the results of a series of plankton hauls made by Sir William Herdman in Port Erin Bay during the years 1907-1920. The catches have been worked through by Mr. Andrew Scott, and the numbers of the larger organisms have been estimated in each example. These quantitative results are tabulated, and means for the series of fourteen years are calculated. There is a very clear seasonal change in the case of each organism, and this repeats itself from year to year throughout its period. The time of occurrence of the maximum of abundance may vary, throughout the series, by a month or more, and there is also a variation in the actual quantities of each organism taken. There may be no similarity, even in the case of closely related species, in these variations of absolute abundance and time of culmination of the invasion, and each species appears to be affected differently by the environmental conditions. The factor influencing actual abundance appears to be a statistical one—a chance association of sub-factors, and not at all any single physical event, or even a few main physical events, in the sea.'

AGE, GROWTH, AND MATURITY OF HERRINGS.

Mr. B. Storrow reported that 'the 1918 year-class of the North Sea in 1920-21 divided into two sections; one migrated north, the other south. The northern section grew rapidly in 1921-22. The area of greatest growth was west of the passage between the Orkneys and Shetlands. Growth is influenced more by environment than heredity. Atlantic water activity is followed by a prolonged spawning season, formation of new spawning grounds, more extensive or more obvious migrations, and a mixing of shoals. The formation of races in the North Sea is a physical impossibility. Spring spawners of the Forth come from northern waters, and so do the East Anglian shoals. Whilst the conditions of the year preceding hatching are held to be of the most importance in the production of good year-classes, those occurring in the herring's third year may modify the yield from the fishery.'

FEEDING OF SOME PLANKTON ORGANISMS.

Dr. Marie Lebour explained that 'living plankton organisms, consisting chiefly of Cœlenterates, were kept alive in the

laboratory in plunger jars, in order to study their food and methods of feeding. Others were examined fresh from the tow-nets. It was found that a large number of species of Medusæ were able to capture and digest small larval and post-larval fishes ; this applied also to Pleurobrachia, Sagitta and Tomopteris. Aurelia, from the scyphistoma and the smallest ephyra up to a breadth of at least an inch and a quarter, was able to feed largely on fishes ; other Medusæ, beginning at less than a millimetre across, were eating young herrings, sprats and sand-eels. It is thus shown that many of these plankton organisms are true enemies of the little fishes, although most of them, practically omnivorous, are able to eat a variety of other food.'

PLANKTON IN RELATION TO THE FOOD OF THE HERRING.

Mr. A. C. Hardy's paper pointed out that 'as part of the general scheme of investigations at present being carried out by the Ministry of Agriculture and Fisheries into the natural history of the North Sea herring, a study has been made of its food at all ages, and that of the mature fish at different seasons of the year. Plankton samples have been taken simultaneously with the catch of fish, and selection of food in the plankton is shown to take place by both young and adult fish. The change of food during the period of growth and throughout the year is described, and such points as the following discussed : the apparent dependence of the young post-larval herring on the copepod *Pseudocalanus elongatus* ; the suspension of feeding in the spawning season ; the preference of small fish, notably sand eels, rather than copepods in the spring ; the importance of Oikopleura ; the distribution of the principal food forms, and, briefly, the relation of the herring to the plankton in general.'

NORTH SEA CURRENTS IN RELATION TO FISHERIES.

Mr. J. N. Carruthers stated that 'in view of the fact that the economics of a fishery are bound up in the fate of the passively floating eggs, larvæ, and planktonic food material, many investigations into the nature of the currents of such an important fishing area as the North Sea have been made. Valuable work by Fulton, some twenty-five years ago, threw light upon the source of the plaice stock of the Scottish coastal areas. The Ministry of Agriculture and Fisheries embarked, in 1920, upon an extensive experiment designed to elucidate the non-tidal movements of both surface and bottom water in the southern North Sea. Drift bottles, both of the surface-floating and bottom-trailing types, were put out from each of seven light-vessels in this area. Twenty-five of each kind

were liberated each week at each ship. The resulting information from this experiment shows very suggestive relationships with fishery research problems.'

YOUNG FISH IN THE CHANNEL.

Mr. R. S. Clark gave a lantern lecture, in which he reported that 'Plaice eggs and larvæ accumulated at the eastern end of the Channel to the west of Isle of Wight. An experiment with drift bottles showed a marked and rapid surface drift from west to east distinctly correlated with the prevailing winds. Larvæ, with the yolk-sac present, were found to be feeding on Oikopleura, Copepod Nauplii, and unicellular organisms. Lemon Dab, as in the northern North Sea, may pass the winter still in the pelagic stage. This feature has its bearing on scale reading. Herring and sprat spawned within the 20 fathom line at definite places not far removed from estuaries. The incidence of pilchards, on the other hand, was proved to be well off-shore, and increased in intensity towards the western end of the Channel. Later post-larvæ occurred at the eastern stations and in the southern North Sea. Hake spawns progressively later from west to east, but appears to break off in the Plymouth area, eggs and larvæ occurring at E. 1 at the end of October. Growth is fairly rapid. The collected records show a modal curve round about 250 mm., which I take to be just over two years old. All these are immature. Concentration areas of young immature hake were found at Plymouth and off the Smalls. These are caught and landed in large numbers, to the detriment of the future supply.'

DISEASE IN THE VAPOURER MOTHS.

Dr. J. W. H. Harrison gave a paper to Section D, dealing with the 'Polyhedral Disease in the Vapourer Moths of the Genus *Orgyia*.' He stated: 'certain Lepidoptera, in particular the Liparidæ, are subject to diseases known as polyhedral diseases, not up to the present recorded from the British Islands. However, an epidemic, quite typical in its symptoms, broke out in a series of cultures of *Orgyia antiqua* reared for genetical research from wild Aberdeenshire ova. In these batches the larvæ attacked succumbed for the most part just before reaching full growth, but others managed to pupate before doing so. Only rarely were imagines reared from diseased broods. Affected caterpillars, immediately after death, disintegrated into a brownish liquid having a faint, nutty, and not unpleasant smell. Microscopical examination showed this to be crowded with bodies roughly polyhedral or crystalline in appearance, which originated within the nuclei of blood, fat, tracheal and other cells. Attempts made to infect the

larvæ of Gipsy and other moths met with but little success, although many *Orgyia* forms proved very susceptible, and from them passage infections were carried out. Clearly, unless the Italian race of *Liparis dispar* employed is immune, the disease is not identical with that attacking the Gipsy Moth. In the successful experiments certain hybrids and races were more resistive than others, and the males more so than the females. This immunity of the male is more apparent than real, and depends on the fact that the male *Orgyia* larva has one less instar than the female. Evidence was secured proving that the disease could be transmitted through the egg.'

EVOLUTION OF APHIDS.

Mr. E. R. Speyer followed with notes on 'the Evolution of Aphids with Complex Life-cycles.' 'Researches upon the Larch Chermes (*Cnaphalodes strobilobius* Kalt.) have brought to light certain processes of development relating to regular increase of one type of individual over another in successive generations, independently of environmental conditions, and to a regular alternation of form controlled by an internal mechanism. From these principles it is possible to arrange the existing species of Chermesinæ in an evolutionary series, starting from the earliest period at which parthenogenesis correlated with apterism resulted in a simple alternating cycle. Subsequent stages in evolution comprise complete loss of sexuality, migration, and morphological changes through natural selection in a second environment, evolution of a return migrant, and recent acquirement of long-lost sexuality through individuals with few characters in common with other individuals of the cycle, and a final recapitulation of the original cycle on the definite host-plant.

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CONFERENCE OF DELEGATES.

PROF. H. H. TURNER presided over the Conference and gave an inspiring address.

At the Adjourned Conference on September 18th, the following Resolutions drafted by the Corresponding Societies' Committee were adopted.

(1) To recommend that the publications of Scientific Societies should conform so far as possible to a standard size of page, for convenience in dealing with offprints; and that for octavo publications, the size of the British Association's Report [*i.e.*, the size of *The Naturalist*] be adopted as the standard.

(2) To urge the adoption by Scientific Societies of the bibliographical recommendations contained in the current Report of the Zoological Publications Committee.

(3) To represent to His Majesty's Government, in view of recent proposals to utilize for naval, military, or commercial purposes

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sites of historic or scientific interest or of natural beauty, such as Avebury, Holmbury Hill, and Lulworth Cove and its neighbourhood, the urgent need of more effective protection of such sites from disfigurement or obstruction.

(4) To request the Minister of Agriculture and Fisheries to reconsider his decision to discontinue the issue by the Ordnance Survey of quarter sheets of the six-inch map on the ground that, if quarter sheets are not available, teachers, students, and others engaged in various kinds of research on local and regional distributions will be put to expense and inconvenience in providing themselves with the sheets necessary for their work.

(5) To represent to His Majesty's Government the urgent need for more ample provision for the Science Museum, and for closer co-ordination between the principal national collections of scientific material.

(6) To call the attention of local scientific societies to the need for prompt and systematic supervision, in the interest of scientific record, of all sections and other excavations which were opened during the construction of new roads or other public works.

(7) To recommend the General Committee to accept the invitation received from the President of the Museums Association to hold the Conference of Delegates in connection with that Association's Meeting at Wembley, in July, 1924; without prejudice to any provision which may be possible for a Conference of Representatives of local societies at the Toronto Meeting.

(8) To apply to the Committee of Recommendations for the renewal of the usual grant of £40 to the Corresponding Societies Committee for the preparation of its Report and Bibliography.

After the above were considered, there was a discussion of the function of Local Societies in connection with Schemes of Town Planning, opened by Prof. Abercrombie.

Delegates are reminded that they are expected to use their best endeavours to make known in their respective Districts the objects and methods of the British Association.

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Botany: A Junior Book for Schools, by R. H. Yapp, M.A. Cambridge University Press, vii.+199 pp., 3s. 6d. net. Teachers will be grateful to Professor Yapp for providing them with such a fresh and helpful guide to their class work. The book reflects fully the newer natural history outlook on plants, not only as living things, but subjects for study out of doors and in relation to their environment. It covers the ground required for junior examinations, and is written in clear and simple language. The subject matter is excellently arranged and illustrated by 159 figures which are well drawn and prepared specially for this work.

Trees and Flowers of England and Wales, by H. G. Jameson. London: Simpkin Marshall, xi.+136 pp., 1909, 3s. 6d. net. We have received a copy of this illustrated guide to the identification of British plants. The author is well known to our readers as the illustrator of Dixon's 'Handbook of British Mosses.' The work consists of a series of keys, *e.g.*, genera with only one British species; trees, shrubs and climbers; leaves in one or more whorls; floating or submerged aquatics; flower parts in threes or sixes; flowers in heads or umbels; irregular or spurred; green or scaly; calyx absent; corolla in one piece; petals separate; then follow natural orders and genera of those not previously dealt with. Small drawings of characteristic parts are given in the margins; there are hundreds of these and are very clear and good for their size, as anyone familiar with the author's work may expect.

COAST CHANGES AT FLAMBOROUGH.

T. SHEPPARD, M.Sc.

PLATE V.

As illustrating the extraordinary way in which changes may take place in a familiar landscape without apparent recognition, a letter was received some time ago from a contributor, Mr. James H. Rowntree, informing us that the 'King' of the King and Queen Rocks, a well-known feature to Flamborough visitors, had lost a 'leg' during last winter. This fact does not seem to have been noticed or recorded, and as the probability is the mass of rock without one of its supports may soon fall, it may be well to record the circumstances.

The illustration (Fig. 1) is from a photograph taken some time ago by Mr. Rowntree; and recently Mr. J. W. Stather, F.G.S., of Hull, has kindly taken a photograph from a position as near as possible to that taken by Mr. Rowntree, which shows the difference in the two aspects of the 'King.' In fig. 1 the water was smooth, and the photograph was taken at high tide, whereas in figure 2 it is low water, and not quite so smooth. The stump of the missing leg is distinctly shown in the foreground.

While Mr. Stather was making enquiries he heard quite by accident that many years ago a well-known feature at High Stacks, known as the 'Matron,' had disappeared. Some state it was struck by a ship. The top of this is just shown in a photograph published as frontispiece to my 'Geological Rambles in Yorkshire,' 1903. Oddly enough, although this particular feature must have been sketched and photographed a large number of times, enquiries in all the likely sources and through the press have so far failed to produce an illustration of the 'Matron.'

Its position is indicated on a map published by Mr. Lamplugh in the *Proceedings of the Yorkshire Geological and Polytechnic Society*, and no such rock exists there to-day. It certainly seems remarkable that in view of the various visitors to Flamborough Headland a feature such as this should have disappeared for several years without having been noticed. We are hoping before long to publish a view of the 'Matron' as it used to be.

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The Bridlington Augustinian Society, recently founded, has issued No. 1 of its *Journal*, which contains an account of the 'Dissolution of Bridlington Priory,' by J. S. Purvis, M.A. (24 pp., 9d.). The publication may be obtained from The Scribe, Fred Millner, Holmleigh, St. John's Avenue, Bridlington.



Fig. 2.

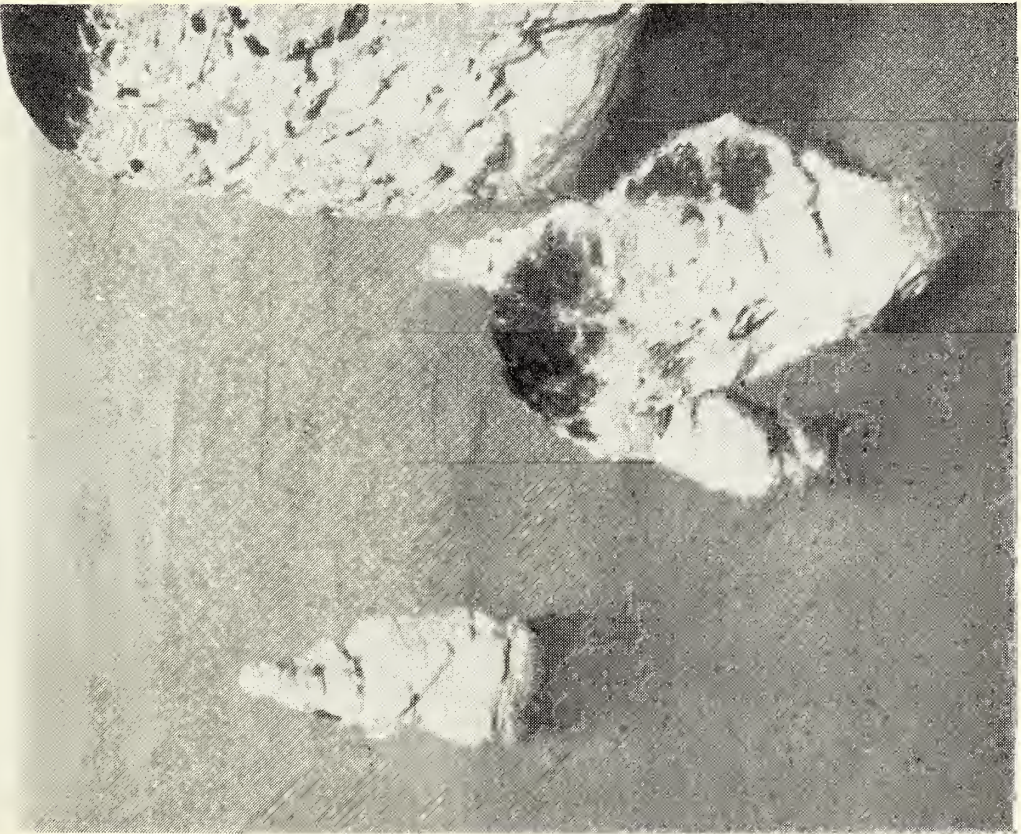


Fig. 1.

ON THE CORRELATION OF YOREDALES AND PENDLESIDES.

J. WILFRID JACKSON, M.Sc., F.G.S.

THE question of the so-called Yoredale Beds of South Yorkshire, Lancashire, Staffs., and Derbyshire was discussed by the late Dr. Wheelton Hind in many papers. One of the most important is that published in 1897* in which he emphasised their position above the Carboniferous Limestone both on stratigraphical and palæontological grounds. He found the palæontological evidence to be of such a nature as to point undoubtedly to a closer biological connection between the so-called Yoredale Beds of Yorkshire and Derbyshire with those above (*i.e.* with the Millstone Grit) and the true Yoredale Beds of N.W. Yorkshire with those below (*i.e.* Mountain Limestone). It appeared to him that the so-called Yoredale Beds of Derbyshire and Yorkshire should really be included in the Millstone Grit Series, as they contain a very similar fauna and flora.† From my own knowledge of the beds, and from information received from other field-workers, I agree wholeheartedly with Dr. Hind's conclusions, that is that the 'shales-with-limestones' lying below the Kinder Scout Grit in Derbyshire, Yorkshire, etc., and frequently called by the name of 'Yoredales,' should be included in the Millstone Grit Series, and consequently be regarded as Upper Carboniferous.

In field-work in North Derbyshire I have for some time made use of a local classification of the beds between the Kinder Scout Grit and the Carboniferous Limestone, as follows :—

1. Kinder Scout Grit.
2. Grindslow Shales.
3. Shale Grit.
4. Mam Tor Sandstones.
5. Edale Shales with Limestones.

CARBONIFEROUS LIMESTONE.

A good typical section of this series is given in the Geological Survey Memoir on North Derbyshire (p. 45).‡ I am indebted to Mr. W. S. Bisat for much assistance in the identification of the goniatites from the Edale Shales, and more

* W. Hind, 'On the Subdivisions of the Carboniferous Series in Great Britain, etc.'—*Geol. Mag.*, April—May, 1897, pp. 159-69 and 205-213.

† Hind, *op. cit.*, p. 209.

‡ 'Geology of the Carboniferous Limestone, etc., of North Derbyshire,' 2nd Ed., 1887, fig. 12 on p. 45.

especially of those from the same series at the foot of the Mam Tor escarpment near Castleton. Without entering into full details, it may be mentioned that the fauna of these shales agrees almost exactly with that of the Sabden Shales of Lancashire and of the Shales below the Kinder Scout Grit in the Todmorden area, Yorkshire. This parallelism holds good also for the succession of the goniatite Zones. The equivalence of the 'Yoredale' Shales of Derbyshire and the Sabden Shales of Lancashire was pointed out by Mr. Bisat at the British Association Meeting at Hull last September.* Since that time I have obtained much material which confirms his conclusions.

It is unfortunate that Dr. W. Hind, in his later paper published in 1901,† included two distinct series of strata in his Pendleside Group, viz., the Bowland Shales and other beds below the Pendle Grit, on the one hand, and the 'shales-with-limestones' (so-called Yoredales) of N. Derbyshire and elsewhere, on the other. He thus nullified his conclusions of 1897. This mistake has led Professor P. F. Kendall,‡ and others, to place the Pendleside Series in the Lower Carboniferous division, immediately above the Subzone of *Cyathaxonia* D₃ of the Avonian (= *Posidonomya* Zone P.).

This procedure would be quite in order for some portion of the Pendleside Series, for example, the Bowland Shales seem to be rightly placed in the *Posidonomya* Zone and to be of Lower Carboniferous age. On the other hand, the 'shales-with-limestones' of North Derbyshire, etc., as shown above, are younger beds, and, containing a fauna agreeing with that of the Sabden Shales, should be relegated to the Upper Carboniferous.

The exact line of division between the Lower and Upper Carboniferous, in the various localities, is not yet settled; but evidence is rapidly accumulating, so that the solution of the problem should not be long delayed. In the Pendle area it would appear to be somewhere about the base of the Pendle Grit, which has long been considered to be equivalent to the Shale Grit of the Peak District; but is now shown to be below that horizon.

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The Annual Report of the Gresham's School Natural History Society gives evidence of more than usual interest in natural history matters on the part of its members. Among the officers we note such well-known names as Oakley, Rowntree and Bather.

* See Sectional Transactions, p. 25.

† Hind and Howe, 'The Geological Succession and Palæontology of the Beds between the Millstone Grit and the Limestone-massif at Pendle Hill, etc.'—*Q.J.G.S.*, Vol. LVII., 1901, pp. 347-402.

‡ 'Handbuch der Regionalen Geologie,' Band iii., The British Isles, 1917, pp. 139, *et seq.*

MIGRATION OF THE FRESH-WATER EEL.

W. H. ST. QUINTIN, J.P.

IN 'Reptiles, Amphibians and Fishes,' edited by J. T. Cunningham, the age at which eels descend to the sea to spawn, as ascertained by counting the annual zones on the scales, is given as, for males usually $5\frac{1}{2}$ to $6\frac{1}{2}$ years, and for females $7\frac{1}{2}$ to $8\frac{1}{2}$ years. But it is stated that, in individual cases, eels live to much greater ages than these without assuming the breeding livery, or migrating to the sea. Two specimens are mentioned as dying after being in captivity for 22 and 31 years respectively. It is supposed that such eels are sterile.

I have a tame eel which was given to me by my friend, Canon Travis. It was rescued from some school children, when about eight inches long, at Ripley, and lived in a tank at the Rectory for eleven years, and has been here just two years more. According to Mr. Tate Regan's calculations, this eel must have been from three to four years old when first captured, and will now be somewhere near fourteen years older than that. It weighed only $15\frac{1}{2}$ ozs. last October. I think it is considerably heavier now, and as soon as it stops feeding for the winter, I shall weigh it again. It ceases to feed early in October, and wakes up with a good appetite at the beginning of April. It can manage ten or twelve big lob-worms at a meal, and I always feed it from the hand, and generally towards evening. It is quite tame, and will, when hungry, push three or four inches of its length out of water to receive the worm from one's fingers, with a rather violent snatch. I believe it would come partially or entirely out of the water for its food, but the tank has a turn-over edge, and this is impossible. I mean to try to devise some sort of sloping raft, with the object of ascertaining how far it will venture to leave its proper element. In regard to this point, in *The Field* of August 30th, there is an interesting account of a number of eels having been discovered travelling overland from a canal to a river; and an editorial reference is made to an eel having been found by Col. R. Meysey Thompson between his pond, at Dringhouses (York), and the river Ouse, in May, 1910. In this case the eel, about 2 lbs. in weight, was dead. I know of several instances of eels having been found at Ashburnham, in Sussex, wandering from a pond, in which they had been placed by the owner, to a large lake in the park, quite half a mile distant. These eels were noticed by several of the members of the family, notably by one of the young ladies, an ardent fisherwoman, who knew that if the large carp were to be taken by rod and line, it must be at, or about, sunrise in summer. These eels were alive, and active in the dewy grass.

YORKSHIRE NATURALISTS AT PENISTONE

W. H. PEARSALL, D.SC., F.L.S., AND F. A. MASON, F.R.M.S.

ON Saturday, July 14th, the 308th Excursion of the Union was held at Penistone, for the investigation of the district including Langsett and Midhope Moors, Cut Gate, and the head waters of the Little Don. Considering the inaccessibility of headquarters to members living in many parts of the county, a gathering of forty members and associates representing ten affiliated societies was not unsatisfactory.

Under the guidance of Mr. E. Snelgrove, B.A., of Sheffield, all sections started from Hazlewood in the direction of Cut Gate *via* the Flouch Inn and Langsett Reservoirs. Arrived on the moors, which are well described in Mr. Wattam's notes, parties worked upstream until Cut Gate was reached, by which time it was necessary to return to Hazlewood station, and thence to Penistone. After tea, a general meeting was held at the Old Crown Inn, Penistone, presided over by Mr. G. T. Porritt, an ex-President of the Union. The reports on the day's work are embodied in the following notes. An interesting observation made by Mr. Morley, but not mentioned in his report, had reference to the discovery of remnants of dead moths of the large species known as the Oak Egger (*Bombyx quercus*). These had puzzled him a good deal until he found a wasp's nest emptied of its living contents by birds, and this suggested a similar cause for the destruction of the moths.

At the close of the meeting, votes of thanks were accorded to the land-owners who had generously permitted access to the private portions of the moors, and to Mr. Snelgrove, who had not only acted as leader to the party, but had also made the arrangements for the meeting. Expressions of appreciation at the Chairman's presence were freely heard, especially when it was known that, in fulfilment of a promise, he had attended at considerable personal inconvenience.

BOTANY AND PLANT ECOLOGY (W. E. L. Wattam):—This long, and by no means wide valley, typical of the Millstone grit area of S.W. Yorkshire, was well worth the visit. Working upwards, to the right the rock outcrops are, for a short distance, fairly prominent, mosses being one of the dominant features of their vegetation, and, where humus has accumulated, *Deschampsia* and *Holcus*, with a glorious wealth of ferns, male, lady, hay-scented, and northern-hard, the verdure of which was strikingly relieved by countless spires of the foxglove. Before the valley decreases in width there are two belts of Scots Pine, and evidently this type of woodland, judging from the decaying remains of trees, extended for some distance up the steeper slopes beyond. A few birch, alder and mountain ash also occur. The chief plant through the whole of the valley is undoubtedly bracken, which covers in luxuriance the basal parts of the hills between the deeply cut valleys and has firmly established itself about the woodland belts. A large portion of the valley bottom has a ground flora of typical grass heath associates *Deschampsia*, *Nardus*, dwarf *Calluna* with the lichen *Cetraria aculeata*, *Juncus squarrosus* and, where there is an excess of moisture, zones of *Juncus effusus* and *J. uliginosus*. After the tree zone is left behind, to the junction of the converging valley coming from the direction of Marjery Hill (1793 feet), the dominant feature is again an almost unbroken sweep of bracken, interspersed with *Deschampsia*, *Nardus*, *Calluna* and bilberry on the drier knolls. To the left of the valley are many deeply cut ghylls, until opposite the Pine belts previously mentioned. The sides of these ghylls are beautifully clothed with the ferns previously listed, and other occupants are *Galium uliginosum*, *Ranunculus Flammula*, *Myosotis palustris*, *Cardamine amara*, and *Prunella vulgaris*. The hill slopes for the distance named, for upwards of half their length towards the highest point of the ridge, are bracken controlled. The remaining higher portions have

an association of *Calluna*, *Ericas*, *Empetrum*, Bilberry, *Deschampsia* and *Agrostis*. Beyond the last of the contributory ghylls the configuration of the ground to near the vicinity of the converging valley coming from Marjery Hill, is a considerable depression, containing a vast swamp with ridges of accumulated debris, upon which the bracken grows in richest profusion. The chief plants denizenizing the swamp are *Sphagnum* and *Polytrichum*, *Hydrocotyle vulgaris*, Marsh Thistle, immense zones of *Juncus effusus* and *J. uliginosus*, *Eriophorum angustifolium*, *Carex flava*, and *Molinia*. A conspicuous feature of this particular area was the abundance of *Vaccinium Oxycoccus* (in association with *Sphagnum*) the myriad stems of which gave quite a rich brown colouration. These extensive cranberry bogs are not uncommon in this neighbourhood. The right of the converging valley is almost entirely clothed with bracken. A depression in the ground between the ridge to the left of this valley, and the higher S.W. ridge beyond, is another swamp, practically identical in plant associates to the one previously described. The S.W. ridge rises very sharply, and being stony, dry loving plants hold sway. The first zone, extending for some distance, is of pure *Vaccinium Vitis-Idæa*, in excellent fruit, next is *Calluna* heath with *Ericas*, *Deschampsia*, and scattered beds of bracken, and on nearing the summit, broad belts of bilberry, ending in a grass heath (with *Calluna*) of *Deschampsia*, *Nardus*, *Agrostis*, a little *Festuca ovina*, with *Potentilla*, *Galium* and *Hypericum humifusum*. This particular ridge was traversed until the starting point was again reached, and it was noted that this last association of plants was dominant throughout.

Many of the meadows passing from the Flouch Inn to the valley were interesting. Their dominant grass occupants were *Avena flavescens* and *Holcus lanatus*, with a slight admixture of *Dactylis*, *Festuca pratensis*, *Cynosurus*, *Anthoxanthum* and *Lolium perenne*. The other plants comprising the vegetation of these meadows were *Plantago lanceolata* and *Trifolium repens* (sub-dominants), *Trifolium medium*, *Ranunculus acris*, *Vicia Cracca*, *Vicia sepium*, *Orobis macrorhizus*, *Lathyrus pratensis*, *Taraxacum officinale*, *Hypochæris radicata*, *Chrysanthemum leucanthemum*, and *Heracleum Sphondylium*.

(E. Snelgrove):—The moorland investigated was almost wholly of the Heather Moor type. There was no cotton grass and very little *Molinia*.

The main stream of the Little Don was worked upwards from the head of the reservoir. One small tributary valley in the left bank, and on the opposite side, the largest tributary, were examined. The latter drains the high ground on the north side of Marjery Hill from the neighbourhood of Cut Gate. In this valley, running due north, the dominant plant was bracken covering, at an estimate, three-quarters of the valley sides, and going up to about 1500 feet. Above that appeared the cloudberry (*Rubus chamaemorus*), but neither fruits nor flowers were seen. The peat here, about 6 feet thick, exhibited remains of birch trees.

Lower down in the valley was a sparse scrub of mountain ash, willow, birch and alder. On the hillside a specimen of Bog Asphodel (*Narthecium ossifragum*) was taken.

In the main valley and the small tributary valley already mentioned there was a good plantation of well-grown pines, the elevation here being about 1000 feet. Male fern was plentiful beyond the plantation. The most conspicuous flower was foxglove (*Digitalis purpurea*). Cowberry (*Vaccinium Vitis-Idæa*) was of frequent occurrence all over the moor; in one place, near Cut Gate, was seen a patch of about 500 square yards almost uninterrupted by any other plant. A few oaks were noticed in the main valley.

BRYOLOGY (F. E. Milsom):—The mosses and hepatics were all typical of the Carboniferous and Millstone Grit country traversed. By

far the most interesting find was *Orthodontium gracile* var. *heterocarpa* which occurred in sheets and in fine fruit along the valley sides from 800 feet to 1600 feet in association with *Calluna*, Bilberry and Wavy Hair Grass. This moss has only comparatively recently been identified in V.C. 63, and several stations have been recorded. Another good moss was *Catharinea crispa* along the banks of the Little Don River.

Of the hepatics, the most interesting was *Cephaloziella bifida* (wet ground form = *C. trivialis* Schiffn.), growing among *Sphagnum*.

As no records have hitherto been published, a complete list is given below of species noted.

MOSSES.

<i>Sphagnum fimbriatum</i>	<i>Webera prolifera</i>
<i>Catharinea crispa</i>	<i>W. nutans</i>
<i>Ceratodon purpureus</i>	<i>Bryum argenteum</i>
<i>Campylopus flexuosus</i>	<i>Mnium punctatum</i>
<i>Dicranella heteromalla</i>	<i>M. hornum</i>
var. <i>interrupta</i>	<i>Eurhynchium rusciforme</i>
<i>D. cerviculata</i>	<i>Hyocomium flagellare</i>
<i>D. squarrosa</i>	<i>Plagiothecium elegans</i>
<i>Racomitrium aciculare</i>	<i>Amblystegium filicinum</i>
<i>Funaria hygrometrica</i>	<i>Hypnum fluitans</i> var. <i>Jeanbernati</i>
<i>Orthodontium gracile</i>	<i>H. commutatum</i>
var. <i>heterocarpa</i>	<i>H. ochraceum</i>

HEPATICS.

<i>Conocephalum conicum</i>	<i>Chiloscyphus polyanthus</i>
<i>Lunularia cruciata</i>	<i>Cephalozia bicuspidata</i>
<i>Pellia epiphylla</i>	* <i>Cephaloziella bifida</i>
<i>Aneura pinguis</i>	<i>Lepidozia reptans</i>
<i>A. multifida</i>	<i>L. reptans</i> var. <i>tenera</i>
<i>Alicularia scalaris</i>	<i>Scapania dentata</i>
<i>Aplozia riparia</i>	<i>S. nemorosa</i>
<i>Lophozia Floerkii</i>	<i>S. undulata</i>
<i>L. ventricosa</i>	<i>Calypogeia trichomanis</i>
<i>L. attenuata</i>	<i>Diplophyllum albicans</i>
<i>Gymnocolea inflata</i>	<i>Lophocolea cuspidata</i>
<i>Plagiochila asplenoides</i>	

MYCOLOGY (F. A. Mason):—Not many fungi were met with before reaching the moors, the only noteworthy species being found on an old boot picked out of a ditch near the Flouch Inn. These were *Penicillium decumbens* and *P. brevicaulis*. The former species has previously occurred only in Leeds, particulars of which will be found in Mr. A. Clarke's 'IXth List of Additions to Yorkshire Fungi,'—when published.

On the moors, particularly in the damper places, the following agarics occurred:

<i>Galera hypnorum</i>	<i>O. pyxidata</i>
<i>G. hypnorum</i> var. <i>sphagnorum</i>	<i>O. philonotis</i>
<i>G. mniophila</i>	<i>Androsaceus androsaceus</i>
<i>Omphalia umbilicata</i>	<i>A. epiphyllus</i>

The most interesting find of the day consisted of several specimens of *Vibrissea truncorum*, a rare British discomycete, found on water-logged heather roots. Several species of microscopic fungi, not yet determined, also occurred in the more boggy places, and these will form the subject of a separate note in due course.

* New record, V.C. 63.

LICHENS (W. E. L. Wattam) :—The species met with were typical of the Millstone grit, and were as follows.

On sandstone outcrops and sandstone walls.—

<i>Leptogium tenuissimum</i> Koerb.	<i>Squamaria saxicola</i> Poll.
(scarce : sandstone debris by streamside).	<i>Callopusia vitellinum</i> Sydow.
<i>Evernia furfuracea</i> Fr. and var.	<i>Lecanora polytropa</i> Schaer.
<i>ceratea</i> Nyl.	<i>L. dissipata</i> Nyl.
<i>Parmelia saxatilis</i> Ach.	<i>L. crenulata</i> Nyl. (on mortar of walls).
<i>P. fuliginosa</i> Nyl.	<i>Baeomyces rufus</i> D.C.
<i>P. physodes</i> Ach. and var. <i>labrosa</i> Ach.	<i>Lecidia contigua</i> Fr.
<i>Platysma glaucum</i> Nyl.	<i>L. lithophila</i> Ach.
<i>Xanthoria parietina</i> Th. Fr.	<i>L. coarctata</i> Nyl.
<i>X. tenella</i> Nyl.	<i>Mycoblastus sanguinaria</i> Ach. (sterile)

On shrubs and trees :—

Lecanora varia Ach. (Ling stems and wood palings).
L. comizæa Ach. (boles of Scots Pine).

On peat :—

<i>Cetraria aculeata</i> Fr. and f.	<i>C. macilenta</i> Hoffm.
<i>hispidia</i> Cromb.	<i>C. bacillaris</i> Nyl.
<i>Cladonia pyxidata</i> Fr.	<i>Lecidia granulosa</i> Schaer.
<i>C. fimbriata</i> Fr.	<i>L. uliginosa</i> Ach.
<i>C. coccifera</i> Schaer. and var.	
<i>phyllocoma</i> Flk.	

MOLLUSCA (Greevz Fysher) :—The spell of very dry weather was unfavourable for the observation of terrestrial Mollusca, and two searchers were unsuccessful in seeing a single specimen of any kind.

Mr. T. W. Saunders took the following species :—

Hyalinia cellaria *H. alliaria* *Ancylus fluviatilis*.

LEPIDOPTERA (B. Morley) :—The only butterfly seen was *Coenonympha pamphilus*, an insect common to the district. Among the moths, *Bombyx quercus* var. *callunae*, was very plentiful and larvæ were seen. The more interesting captures of the day included the following species :—

<i>Hepialis vellea</i> var. <i>gallicus</i>	<i>Amphisa germinatingana</i>
<i>Acidalia fumata</i> , plentiful	<i>Sericoris cespitana</i>
<i>Hadena dentina</i>	<i>Tortrix viburnana</i> , plentiful
<i>H. psi</i>	<i>Bactra lanceolana</i> , swarming
<i>Larentia caesiata</i> , plentiful	Larvæ of <i>Saturnia pavonia</i> were also seen.
<i>L. viridaria</i>	
<i>Ecophora subaquilella</i>	

HEMIPTERA (J. M. Brown) :—Owing to the wet state of the vegetation and the absence of sunshine, the collections made were not as representative as had been expected. Perhaps the most interesting Heteropteron found was *Bryocoris pteridis* obtained by sweeping among ferns near the riverside. Both the developed and the undeveloped forms were met with, and in approximately equal numbers. This is rather unusual, the undeveloped form being generally much more plentiful than the other, both sexes appeared to be equally plentiful, whereas the females usually far outnumber the males. In Yorkshire this species has previously been found only at Lythe by Mr. E. A. Butler.

As no previous records for this district have been published, the full list of the 24 species noted is given.

HETEROPTERA.

Velia currens F. On the river. Immature individuals were most abundant.

Nabis flavomarginatus Scholtz. A few immature individuals among heather.

Salda saltatoria L. By the river side.

Pithanus maerkeli H.S. Swept from grass.

Leptopterna ferrugata Fall. One specimen among grass.

Miris calcaratus Fall. One individual among grass.

Plesiocoris rugicollis Fall. In plenty, beaten from sallow by the river.

Bryocoris pteridis Fall. Very numerous on *Athyrium filix-foemina*.

Psallus variabilis Fall. and *P. varians* H.S. Beaten from oaks in plenty.

HOMOPTERA.

Philaenus spumarius L. In plenty everywhere. f. *spumarius* Edw., f. *lineatus* F. and f. *populi* F. were noted.

P. lineatus L. Not so common.

Accephalus bifasciatus L. Fairly plentiful at the roots of ling.

Deltocephalus flori Fieb., *D. thenii* Edw., and *D. abdominalis* Fab.

Obtained by sweeping grass, the last two plentiful.

Thamnotettix prasinus Fall. A few on tree trunks.

Dicraneura mollicula Boh. Swept from *Teucrium scorodonia*, on which plant it is frequently very plentiful.

Eupteryx urticae Fab., and *E. stachydearum* Hdy., common.

Typhlocyba tenerrima H.S. Plentiful on brambles.

Psylla peregrina Forst. On whitethorn. *Ps. alni* L. very plentiful on alder, and *Ps. ambigua* Forst. on sallow..

APTERYGOTA (J. M. Brown) :—A few species of these small insects were collected, most being common and widely distributed species ; several, however, are of considerable interest.

Campodea staphylinus Westw., *Isotoma viridis* Bourl., *Isotomurus palustris* (Muller), *Tomocerus minor* (Lubb.), and *Lepidocyrtus lanuginosus* (Gmel.) were plentiful under stones. *Entomobrya nivalis* (L.) and *E. nicoleti* (Lubb.) were common on and under heather.

Cyphoderus albinos (Nic.) occurred in the nests of ants under stones, and *Agrenia bidenticulata* (Tullb.) was exceedingly numerous on the partly submerged stones bordering the river. The last two species have not previously been recorded for the county.

On a patch of bare soil and on the surrounding plants *Bourletiella hortensis* (Fitch) occurred in large numbers and of exceptional size, some reaching 2 mm. in length, that is about twice the size of specimens commonly found in gardens in this country and in America. This feature combined with a slight difference in anatomy may indicate a new variety.

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British Plant Names and their Derivations, by R. J. Harvey-Gibson. A. & C. Black, 50 pp., 2/6 net. Dr. Harvey-Gibson, in his experience as a University teacher of Botany, found that few students had any conception of the origin and meaning of the scientific names of plants. In this respect, however, students are not exceptional. Hooker's *Flora* gives the meaning of most of the generic names, but this new book fills a gap in that it gives the derivation and accentuation of both generic and specific names of our British plants. This should prove both useful and interesting to botanists in general, and the naturalist will derive much pleasure from looking over these pages, and learning, often for the first time, the meaning of familiar plant names. Many quaint beliefs are suggested by some of them, e.g., *Sedum* from *sedo* to calm, from the belief that when planted on roofs it warded off thunderstorms ! The puzzling question of capital letters for certain specific names is solved by dropping all specific capitals. This attains a 'consistent typography,' but does not help the student who wishes to conform to orthodox rules.—W.

FIELD NOTES.

Pied Wagtail Nesting in a Coal Wagon.—After a wagon of coal reached the Starbeck depot, it was found that a Wagtail had built her nest amongst the coal, and was sitting upon her eggs. The wagon remained in the siding about ten days, and unfortunately the eggs were hatching out upon the day the coal had to be tipped, which caused the destruction of the nest. It did not occur to the yard men to transfer the nest and young to some other position, where the parents might have continued their care.—R. FORTUNE.

Green Sandpiper near Huddersfield.—On the 22nd August, John M. Spencer-Stanhope, Esq., of Cannon Hall, sent to the Huddersfield Museum a Green Sandpiper in the flesh, with the intimation that ‘unfortunately it was shot in mistake for a Snipe’ on the moors above Dunford Bridge, on the date named. It was in good plumage, and Mr. Stanhope further writes that “there were four specimens of this bird observed on the High Moor near Holme Moss while shooting the week before, by a gentleman—a great lover of bird life.’ There have only been two previous local records, one being of a bird already in the Museum, which was secured at Dalton about sixty years ago.—CHARLES MOSLEY.

The Swift in the Harrogate District.—The unfortunate influence the wretched weather experienced in the spring of this year had upon the movements of the Swift in this district should be recorded. The average date for the arrivals of the birds at Harrogate is May 6th; this year a single bird appeared on the morning of May 3rd, and by the evening many more had arrived; on the 4th there was a good influx, and by the 6th our full numbers seemed to have reached us; up to the 9th genial conditions prevailed; on the 9th we experienced a high wind which heralded a change in the weather, as after that date it seemed to go to pieces, and from the 10th to the 16th bitterly cold weather with north-easterly winds and much rain was experienced; on the 11th all the Swifts left, but on the 16th, a bitterly cold and wet day, a single bird was seen, but this disappeared again; on the 19th, another dull, cold and showery day, two birds were in evidence, and by the 23rd, a few more had returned, the weather in the interval being mostly dull and disagreeable. The 25th and 26th, both cold days, witnessed a further influx, and on the 27th a pair of birds appeared, for the first time this year, at their nesting place on my house; there are usually two pairs, but this year only one pair has put in an appearance. The weather now, although very cold until the end of the month, was of a rather more genial character, but after the 27th, there does not seem to have been any further increase in the number of birds, and for the remainder of the summer, we do

not appear to have had much above half the usual numbers. Had the remainder perished in their nesting holes or had they found more genial quarters? By August 16th there was a marked decrease in the numbers, and they continued to decrease until the 24th, when only a very few birds remained. On the 25th a careful search did not reveal a single bird. On August 8th I saw a very large flock of birds, numbering some hundreds, manœuvring high up in the air above Ripon, apparently preparatory to their southward flight.—R. FORTUNE.

Fox Shark at Whitby.—A Fox Shark measuring 15 feet 3 inches in length was caught in a salmon net about a mile from Whitby Piers on August 6th. It was exhibited in the fish market.

Bats at Swineshead Church, Lincs.—On the occasion of a recent visit to Swineshead, we found a considerable number of bats flying about in the church, and learned from the lay official that during his eleven years in office he had killed 6000 bats in the Church. From the dead ones I saw they are evidently mostly the Common Bat, or Pipistrelle—*Vesperugo pipistrellus*. The official said there were also some very large park bats, probably noctules.—C. S. CARTER, Louth.

Sharks off the Yorkshire Coast.—The arrival of shoals of herrings off the Yorkshire Coast has brought in their train various predatory fish which prey upon them. Very large shoals of Picked Dogfish (*Acanthias vulgaris*) have assembled off Scarborough, and are a nuisance to the fishermen, as they bite and mutilate the netted fish. Many Tope (*Galeus canis*) of an average length of five feet have also been captured, and together with the Picked Dogfish are skinned and sold under the name of 'flake' in the fish shops. Several Porbeagle Sharks (*Lamna cornubica*) have also been captured in the herring nets. Four, ranging in length from 6 ft. to 8 ft., were landed at Scarborough on September 3rd, having been caught eight miles from the town. This fine and elegantly shaped Shark seems to be the commonest of the larger species which visit the North Sea, and specimens are taken every summer. They are quite good food, but are not made use of locally in any way, although on the other side of the Channel they are regularly sold in the French fish shops and are esteemed a delicacy.—W. J. CLARKE.

Sheep and Early Man.—In reply to Dr. James Ritchie's note in *The Naturalist*, ante, p. 180, in which he says that I have omitted the Scottish records quoted by him in his 'Influence of Man on Animal Life in Scotland,' I regret to say that I cannot accept these as reliable evidence of Sheep in Neolithic times. In common with numerous records in

England and Wales, the Scottish records are invalidated by the fact that they relate to superficial deposits liable to disturbance by burrowing animals. Under such circumstances it is not possible to be sure that remains of Sheep are contemporaneous with human remains, even when both are found together. The former may be, and frequently are, quite recent. It was for this reason that I rejected all such records as unreliable. I accepted only the evidence of cave deposits which had not been disturbed. I asked Dr. Ritchie if he knew of any such evidence in Scotland, but as up to the present he has not replied, I presume there is none. My paper has been read in Leeds, Buxton, Sheffield, Birmingham, and Shrewsbury, and been discussed thoroughly at each place. In no case has any evidence been adduced to contradict the contention that there were no Sheep in Britain in Neolithic times.—H. E. FORREST.

Pleurotus circinatus Fr. in S.W. Yorks.—Enclosed is a specimen of this fungus which I found yesterday, July 14th, on a dead ash-tree near Upper Haugh. Of this species, one record only (Owston), appears in 'The Fungus-Flora of Yorkshire.'—J. H. PAYNE, Newhill, Wath-on-Dearne.

Panus conchatus Fr. in the Don district.—On revisiting, on July 30th, the dead ash at Upper Haugh, I found, growing upon it, a crop of this fungus. Above there was a fresh growth of *Daldinia*, so I conclude this to be the tree mentioned by Mr. A. A. Dallman, (*The Naturalist*, p. 245).—J. H. PAYNE, Newhill, Wath-on-Dearne, 4th August, 1923.

Giant Foxglove in Yorkshire.—A few self-sown foxgloves (*Digitalis purpurea*), appeared in a semi-wild part of my garden alongside a small laburnum and elder. One of the foxglove plants, early this season, showed signs of unusual growth by producing very large leaves, some of the lower ones measuring $14\frac{1}{8}$ inches from axil to apex, and the blade 6 inches in breadth. Later it produced a raceme of flowers in keeping with the rest of the plant, and on the 10th of September this specimen had attained a height of 8 feet 4 inches, and had borne 180 flowers and capsules. Other specimens appearing at the same time, and growing alongside it, were of normal growth.—T. W. WOODHEAD, Longley Road, Huddersfield.

Association of *Paludestrina jenkinsi* and *Sphærium lacustre*.—Mr. C. S. Carter's note in this journal for August, p. 286, on the association of *P. jenkinsi*, *S. lacustre* and *Bithynia tentaculata* is interesting. The same association occurs at the mouths of at least three rivers running into Lough Neagh, the Six-mile Water at Antrim, the Upper Bann

at Charlestown, and the short canal at Maghery, connecting the Blackwater with Maghery Bay for navigation purposes. At the first station mentioned the *Paludestrina* can be dredged in myriads, as Mr. Arthur W. Stelfox and I found on a day's visit there. Ten years previously, Dr. R. F. Scharff and I found none of that species, but we did find many *S. lacustre*, with very large numbers of *S. corneum*, and many *Bithynia*. On the second visit, Mr. Stelfox and I found that the *S. lacustre* had enormously increased in numbers—I know nothing like it elsewhere I have collected—and the *Paludestrina* also, Two or three specimens of it only having been found by the late H. L. Orr and myself a week after my visit there with Dr. Scharff.—R. J. WELCH, Belfast.

Rare Bryums.—Within a distance of a dozen miles of Grimsby the Order Bryaceæ is well represented, and rare specimens of Bryums are found chiefly on the banks of the Humber estuary south of Grimsby, and often with abundance of spore-bearing capsules. The rarest is *B. mamillatum* Lindb., which I first noticed in 1919, on ground which had been used as an encampment, and a new surface of alluvial soil had thus been exposed. It was then fruiting plentifully, but since has only appeared very sparingly. *B. Warneum* has a similar record. During the summer of 1913 there were large patches which, with their yellow capsules on tall setæ, formed quite a feature of a damp, sandy part of the shore. Every summer since, it has appeared sparingly, or not at all. This year it (*Warneum*) occurs a few miles further south of Grimsby, along the coast. As an instance of the association of different species of plants, we have here in a restricted area four Bryums, viz.—

B. Warneum Bland.
B. Marratii Wils.

B. calophyllum R. Br.
B. lacustre Brid.

Another uncommon species we have in chalk quarries, viz., *Bryum torquescens* Husn. To complete the list of local Bryums we have—

B. pendulum Schp.
B. inclinatum Bland.
B. pallens.
B. pseudo-triquetrum Schwaeg.
B. bimum Schreb.
B. intermedium Brid.
B. caespiticium L.
B. capillare L.
B. murale Wils.

B. erythrocarpum Schwaeg.
B. atropurpureum W. & M.
B. argentium.
Webera nutans Hedw.
W. annotina Schwaeg.
W. carnea Schp.
W. albicans.
Leptobryum pyriforme Wils.

—G. H. ALLISON, Grimsby.

The Immingham 'Meteorite.'—Under the heading of 'In the Track of the Storm,' 'Houses Struck by "Fireballs,"' 'Hailstones and Floods,' the following note appeared in one

of the London morning papers on the 11th of July:—
 'IMMINGHAM.—As Mr. Oliver Hewitt, a caretaker, was about to unlock a school gate at Immingham, Lincolnshire, the bunch of keys was struck from his hand. At the same time a white-hot stone, about the size of a cricket ball, struck the wall and rebounded into the road. The stone was secured by the vicar, the Rev. R. P. Wade.' From a report we have since seen from Mr. Hewitt, it is clear that he had a somewhat startling experience, and was evidently in close proximity to a flash of lightning. Through the kindness of the Rev. R. P. Wade, we have had the privilege of examining the alleged meteorite. It is a piece of ironstone slag such as is used for road-making in various parts of the country. It is quite angular, and measures 3 inches by 2½ inches, and weighs 14 ounces. It certainly appears to have been subjected to great heat recently, and one can quite believe Mr. Hewitt's story that it caused a cissing noise in the water, but we assume this is due to the fact that the stone had been struck by the lightning. It certainly did not descend from the heavens. As so many strange reports of fire-balls, and so on, appear in the press nowadays, it is of some satisfaction to be able to investigate the case, as has been possible in this instance, through the kindness of the vicar.—T. SHEPPARD.

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Prof. F. O. Bower writes on 'The Earliest Known Land Flora,' in *The Proceedings of the Royal Institute of Great Britain*, No. 114.

The Transactions of the Entomological Society of London for August contain, among other valuable items, 'Description of the Pupal Shell of *Lachnocnema bibulus* Fab.,' by G. T. Bethune-Baker; 'On the homology between the Genitalia of some species of Diptera and those of *Merope tuber.*,' by F. Muir; and 'Observations on the Growth of the Larva of the Puss Moth, *Dicranura vinula* F.,' by G. B. Walsh.

The Transactions of the Cumberland and Westmorland Antiquarian and Archæological Society, Vol. XXIII., edited by W. G. and R. G. Collingwood, besides numerous papers on Mediæval and Roman matters, includes 'Elva Stone Circle,' by W. D. Anderson; 'Antiquities at Dean, by J. R. Mason; 'The Tumulus on Great Mell Fell,' by W. D. Anderson; and 'An Inventory of the Ancient Monuments of Cumberland,' by W. G. Collingwood.

According to a paper in *The Transactions of the Institution of Mining Engineers*, by H. P. W. Giffard, a total of over 25,000 feet of borings were put down in Derbyshire alone in the search for oil, and in 1921 'it was decided that no further drilling should be undertaken by His Majesty's Government. Arrangements were made to plug all the wells except D'Arcy, and to recover as much of the casing as possible.' One wonders what was the cost of this little experiment.

The Proceedings of the Geologists' Association, issued on August 15th, contains the Presidential Address of Mr. S. Hazzledine Warren, dealing with the question of 'Sub-soil Pressure-flaking,' and from the information and illustrations which he gives, one is certainly made 'furiously to think' (to use his words) as to whether a lot of the chipped flints found in early geological deposits (the only evidences of 'human' handiwork therein), are not really after all, in many cases, merely natural features.

CORRESPONDENCE.

OTTERS AT MEANWOODSIDE.

I have seen Mr. Holmes again. He assures me that all five otters escaped uninjured, notwithstanding attempts to capture them by means of traps and dogs. Later they were reported in the district of Adel Dam, about three miles from his farm, but seem to have soon moved on from there. The feathers reported were certainly there, but perhaps coincidentally. The fact that fowls and ducks were missing locally at that period is not direct evidence that the otters were the culprits.—JASPER ATKINSON.

THE FULMAR IN YORKSHIRE.

Mr. Booth's notes in *The Naturalist* (pp. 259-260) are especially interesting as marking the changes in the personnel of our Bempton breeding birds after an interval of 9 years. In one respect, however, I must venture to differ from his views. The Herring Gull has increased greatly as a breeding species during that period and its depredations among eggs and young of Guillemot and Razorbill are becoming more serious every year. Another danger also threatens the Guillemot. The Kittiwakes are taking possession of many of its favourite nesting shelves and shouldering the original population of Guillemots off these. The Guillemot seems, in fact, to suffer more than any other species from depredations of Gulls and Jackdaws, from oil on the water, from the blowing up of vessels beneath the cliffs, and lastly, from the nests of the Kittiwakes.

On one point I must join issue with Mr. Booth: he insinuates that the climbers have taken Fulmars eggs in 1923. In 1922 there was no protection order and six eggs were taken. In 1923 the protection order has been respected, and the eggs left alone. As one who has known the climbers intimately during the last thirty years, I must protest against this insinuation. They are as fine a body of men as can be found on the East Coast, with the true Yorkshire spirit of independence. They take as great an interest in the birds among which they work as any of the visitors who parade the cliff-top. Admittedly, the protection of the eggs is in their hands and depends almost entirely upon their good-will. If the birds are increasing as rapidly as Mr. Booth reports, they need no protection at all, their value, apart from the picturesque, being very doubtful, and their rapid increase in other localities leads one to suppose that they will in course of time displace other more interesting species.—E. W. WADE.

The editor has kindly allowed me to see a proof of the above note. On May 26th, when we were actually on the cliffs, one Fulmar's egg certainly changed hands, and Mr. F. H. Edmondson, the Hon. Sec. of the Yorkshire Naturalists' Union Wild Birds' and Eggs Protection Committee, has the name and address of the purchaser. We discussed on the spot what action we should take, and decided that, as the climbers were leaving many eggs, and that as the chief desire of the Yorkshire Naturalists' Union Committee that the Fulmar should become established on these cliffs was gratified, we decided not to take any action. A second Fulmar's egg was also reported by our friends. My respect for these hardy, fearless fellows, the 'climbers,' is quite as great as that of Mr. Wade's. Mr. Wade misinterprets my notes when he speaks of an *interval* of nine years. During the past nine years I must have paid quite a dozen visits to these cliffs. I stated that it was nine years since I had spent a whole day there during the full nesting season.—H. B. BOOTH.

—:o:—

The Fiftieth Annual Report of the Peterborough Natural History, Scientific and Archaeological Society contains a remarkably good list of gifts to the Museum, principally 'by-gones,' a List of Members almost startling in its extent (850 as against 669 last year), a Preliminary List of Local Diptera, and an illustrated note on Entomology and Microscopy.

NEWS FROM THE MAGAZINES.

A discussion on Variation in Lepidoptera occurs in *The Entomologist* for August.

R. I. Pocock writes on 'Rhinoceroses, Living and Extinct,' in *Conquest* for September.

H. Graves describes 'Headward Erosion' in the Summer Number of *The Geographical Teacher*.

The Editor of *Discovery* informs us that a 'Scotch' visitor to the Zoo once looked at an elephant and said 'I don't believe it!'

Interesting illustrations of various species of Cetacea, from photographs, occur in Hutchinson's *Animals of All Countries*, Part XV.

F. W. Frohawk figures and describes a remarkable aberration of *Hemaris fuciformis*, from Surrey, in *The Entomologist* for September.

The Journal of the Ministry of Agriculture for September contains a paper on Garlic-Scented Pennycress: 'A Weed New to Britain,' by W. M. Ware.

G. Dollfus gives a lengthy notice of Morley Davies' paper on 'Jurassic History' (*The Naturalist*, No. 789, p. 311) in *Revue Critique de Paleozoologie* for July.

Professor Sir Arthur Keith writes on 'The Adaptational Machinery concerned in the Evolution of Man's Body,' as a special supplement to *Nature*, No. 2807.

Part 12 of *The Pageant of Nature* has, among many other interesting articles, an instructive paper on the 'Mechanics of Bird Flight,' by Clarence Winchester.

The Selborne Magazine, 'No. 351, February-September, 1923, Vol. XXIX.,' consists of eight pages of notices, etc., and is sold at one shilling, and threepence extra if on art paper.

We notice that *Camping* continues to entertain its members. The September issue, among much other matter, contains a letter from Sir Martin Conway, in which he describes a little rush round the continent.

The Entomologist's Monthly Magazine for September contains a portrait of the late W. W. Fowler; 'Tineina in the Oxford District,' by E. G. R. Waters; 'Observations on British Coccidae,' by E. E. Green, etc.

The Ibis for July contains the Report of the Committee on the Nomenclature and Records of the Occurrences of Rare Birds in the British Islands and certain necessary Changes in the Nomenclature of the B.O.U. List of British Birds; and 'On the Specific Name of the Common Guillemot,' by F. C. R. Jourdain, among many other interesting notes.

From Dr. T. Wilson Parry we have received an interesting Address on 'Trephination of the Living Human Skull in Prehistoric Times,' reprinted from *The British Medical Journal* for March. Dr. Parry has experimented with flints upon human skulls, gives the results of his work, and opines that the trepanning was by no means a lengthy nor necessarily very painful operation.

From the following notice by M. Cossmann, in the *Revue Critique de Paleozoologie* for July, it would appear that one of our greatest living authorities agrees with the opinion expressed in *The Naturalist* for July, 1922, p. 240, viz., that the object found is not molluscan:—'Un Gastropode wealdien de 2m., 22 de longueur, terrestre, sénestre, comportant environ vingt-trois circonvolutions, serait extraordinaire . . . si c'était réellement un Gastropode? Mais, comme l'on n'en connaît ni l'ouverture, ni l'opercule, ni même la coupe longitudinale, et que ce débris se compose de rondelles successives assez régulièrement adhérentes, il est vrai, rien ne prouve que ce corps étrange soit le moule interne d'un Mollusque. Sont-ce des Coprolithes d'un *Iguanodon*, ou des restes de cheminement d'un animal quelconque? On en est réduit aux conjectures et, en attendant, la création du G. *Dinocochlea* (*D. ingens*) était bien prématurée!'

NORTHERN NEWS.

Among the additions to the list of members of the British Ornithological Union we notice the name of T. Sheppard.

From Professor Cecil H. Desch we have received his Address on 'The Services of Henry Clifton Sorby to Metallurgy,' being the second Sorby Lecture.

Publication No. 81, issued by the Belfast Museum, is a well-illustrated pamphlet on 'Injurious Insects,' written by the Curator, Arthur Deane, and sold at one penny.

A well-known Yorkshire Museum is no doubt flattered to see four of its penny pamphlets offered for sale in a recent second-hand book-dealer's catalogue, one being priced at 1/-, two at 3/- each, and one at 4/-.

For twopence can be obtained a table showing a 'Statistical Summary of Output, and of the Costs of Production, Proceeds and Profits of the Coal Mining Industry for the quarter ended March, 1923' (H.M. Stationery Office).

We regret to announce the death of W. H. Thomas, J.P., of Middlesbrough. He was always keenly interested in the work of the Yorkshire Naturalists' Union, and took an active share in the work of the Cleveland Naturalists' Society.

Among the species figured and described in Part XL. of Buckman's Type Ammonites, are *Paltoleuroceras bisulcatum*, *Phlyseogrammoceras electum*, *Euaptoceras infernense*, *Stiphromorphites nodatipinguis*, *Simoichites simus* and *Glottioptychinites glottodes*.

We learn from the London press that 'One hundred and nine bronze coins of the Roman period were found recently in a heap at Filey. It is presumed that a Yorkshireman of the time was trying to get a box of matches. The machine, no doubt, has rusted away.'

The National Trust for Places of Historic Interest or Natural Beauty has issued its Report for 1922-1923, the map accompanying it demonstrating in a very striking manner the annually increasing power of this useful body with regard to the preservation of England's beauty spots.

'A bird lover,' writing to *Punch*, says:—'This year, in my Sussex garden, a blackbird has mated with a thrush. I should be much obliged if your ornithological expert will tell me if I should be right in speaking of the offspring as blushes or thwackbirds.' *Punch* is silent on the matter. We could find a name for 'A bird lover.'

The British Association had an unusual experience at Liverpool in welcoming, as its President, a scientist from the Dominions. Sir Ernest Rutherford is a New Zealander who has devoted himself to the study of radio-activity. Of the ninety previous meetings of the association, twelve have been held in Yorkshire and eleven in Lancashire.

The Belfast Naturalists' Field Club has published a Second Supplement to, and Summary of Stewart and Corry's Flora of the North-West of Ireland, compiled by Sylvanus Wear, with an Introduction by R. Lloyd Praeger. The supplement is well illustrated, contains 129 pages, and is a distinct contribution to the botanical literature of Ireland.

A Hull newspaper correspondent has recently visited the Morfitt collection at Atwick, and gives descriptions of the various objects discovered in the area by Messrs. Morfitt. Of the two 'Maglemose' harpoons, however, which by some people are considered to be of such extraordinary value and importance, not a word is said. One wonders why?

The daily press informs us that 'large animals of the "sea serpent" type have been observed this summer by fishermen at several places along the west coast of Norway. It is thought that they may be specimens of the "basking shark," or "sun fish," which used to be prevalent in Norwegian waters, but which disappeared about the middle of last century. The basking shark attains a length of between 40 and 60 feet. The liver is the most valuable part of its body.'

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Oct., 1923.

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A STUDY IN ECONOMIC ORNITHOLOGY.

By *WALTER E. COLLINGE, D.Sc., F.L.S., M.B.O.U.*

*Corresponding Fellow of the American Ornithologists' Union ;
Member of the Wild Birds' Advisory Committee (Scotland) ;
and Keeper of the Yorkshire Museum, York.*

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Huddersfield Arch. and Topog. Society. 1st Report, 1865-1866. (38 pp.).

Illustrated Scientific News. 1902-4. (Set).

Journ. Micrology and Nat. Hist. Mirror. 1914—

Keighley Naturalists' Society Journal. 4to. Part 1.

Lancs. and Cheshire Antiq. Soc. Vols. IV., V., VIII., XXV.

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Regional Survey.



NOTES AND COMMENTS.
THE FOX.

Now-a-days, unfortunately, some cranks are continually crying out for the destruction of some bird or beast inhabiting these islands. The angler demands the destruction of the otter, kingfishers and other birds ; farmers and others cry out for the extermination of rooks, finches, pheasants, rabbits, hares, etc. Most gamekeepers do their best to exterminate hawks, owls, etc. In no case do they judge these unfortunate members of our fauna upon their merits, and all sorts of wild statements are made without any study or examination of the pros and cons. The latest tirade is in a pamphlet entitled 'Reynard : the Case against the Fox,' * by G. W. Clark, M.A., F.Z.S., M.B.O.U., and in twenty-four chapters, with a poem and a preface in addition, the author makes many wild statements.

FOX HUNTING.

From the preface we learn that 'the deplorable crisis in agriculture,' and 'one of the greatest stumbling blocks to agricultural prosperity in this country is fox-hunting,' and that 'it has established a Junker class who imagines that it has the right to rob and trample on those with whom it comes in conflict.' He also states that 'I give a rough estimate of the losses incurred through fox-hunting in the year 1920. These totalled no less than £40,000,000 (forty millions), and in all probability it was double this high amount, for my estimate was extremely conservative.' It is not necessary to go beyond the preface to show the nature of this pamphlet. The writer holds no brief for fox-hunting, but without it we should soon lose an interesting and handsome member of our diminished fauna, and surely no one has the right to demand the extermination of any of our nature beasts or birds ; we have few enough, goodness knows, and for a man who writes F.Z.S. and M.B.O.U. after his name to advocate such a policy is surely wicked.—R.F.

THE ROCHESTER NATURALIST.

The Rochester and District Naturalists' Club has recently issued No. 129 of its publication, *The Rochester Naturalist* (38 pp., 1s.), after having suspended publication for about eight years. It is edited by Mr. J. H. Evans, and certainly displays signs of activity and enthusiasm on the part of its members. Besides Reports on the work of the various sections (Archæology, Botany, Ecclesiology, Entomology,

* Published by the author at 'Homeland,' Anglesey Abbey, Lode, Cambridge, price 1s.

Geology), there are articles on 'Our Insect Fauna,' by G. E. Frisby; 'On the Delimitation of our Area,' by H. J. Eason; and 'Benjamin Harrison, of Ightham,' by W. H. Cook.

MINERS AND WITCH STONES.

In Part XXIV. of *The Yorkshire Dialect Society's Transactions*, Mr. H. J. L. Bruff gives a lengthy Glossary of Mining Terms in common use among the miners of Greenhow Hill, in Yorkshire. With regard to 'Witch Stones,' he states:— 'I have frequently found stones with natural holes in them placed in conspicuous positions in old workings re-opened by me. I did not at first realise their object, and like the present generation looked upon them as curios, until an old miner told me they were "lucky stones." In the past, these stones were placed in conspicuous places to scare away witches and evil beings. The evil spirits would often try and follow the spirits of dead miners down below, and, in particular, if the man had been killed by an accident. Anniversaries were particularly favourable times for the spirits to gain power over other miners, especially relations of those killed, who refrained from entering the workings, and never did a night shift at such times.'

LIVER ROT AND LIMNAEA.

In *The Journal of the Ministry of Agriculture* for August, Mr. C. L. Walton has an article on Liver Rot of Sheep, in which he says:— 'Since these articles were written there has been a good deal of discussion and observation with regard to the snails acting as intermediate host with the following important results. There are present in North Wales three distinct species of freshwater snails of the genus *Limnaea*, these being (a) *L. truncatula*, a small species, very abundant, and the usual carrier and intermediate host of the flat worm causing liver rot; (b) *L. peregra* (or *pereger*), a larger and stouter species, equally common, but generally found on softer mud than the former; and (c) *L. palustris*, a species as large as (or larger than) *peregra*, but with a longer, narrower, darker and more pointed shell. Further, *palustris* is a much less widely distributed species than the other two, although locally abundant, as on part of the Malldraeth Marsh (Anglesey), the Abergele district and elsewhere. During work on these snails in Mid and North Wales the writer had several times obtained from *L. peregra* young (larval) flukes indistinguishable from those causing liver rot, and so common in *L. truncatula*. Dr. Monica Taylor (in recent letters to *Nature*) believes that this snail (*peregra*) is the usual carrier in some parts of Scotland, where liver rot occurs and *L. truncatula* is scarce or absent. Such being the case it becomes

necessary for Welsh farmers and others to regard this second and very common species as probably dangerous, and to destroy it whenever possible. Fortunately the means advocated for the one are equally effective for the other. No incriminating evidence seems as yet to have been obtained against *L. palustris*.'

NOMENCLATURE AGAIN.

In a note on 'The Name of the Scottish Ptarmigan,' by Ernst Hartert, in *British Birds* for October, we learn that 'The British Ornithologists' Union List Committee, after careful examination of the text, has come to the conclusion that Macgillivray's name *Lagopus cinereus*, which I adopted for the Scottish form of the Ptarmigan, must after all be regarded as a substitute name for others used for the Ptarmigans of Europe, and cannot formally be construed to refer to the Scottish form as different from the other European ones. This view being taken, there is no name available for the Scottish Ptarmigan, and I therefore call it *Lagopus mutus millaisi* nom. nov.'

ZOOLOGICAL BIBLIOGRAPHY.

The present writer has been requested by the Corresponding Societies' Committee of the British Association to draw attention to the Report of the Committee on Zoological Bibliography and Publications, which was presented at the Liverpool meeting of the Association, and to ask those interested in the publications of scientific societies earnestly to consider the recommendations made by this Committee, and thus avoid the unnecessary confusion and difficulties which arise from thoughtlessness rather than ignorance. There are many important points to be borne in mind, particulars of which can be seen in the Report of the Committee, which can be obtained from the Secretary of the British Association, Burlington House, Piccadilly, W.1, but the matters to which particular attention is desired are : (1) The size of the publication, which should be demy octavo, that is the size of the Reports of the British Association and of *The Naturalist* ; (2) that each part issued should bear the actual date of publication ; and (3) that the titles of papers should, as far as possible, give a fair idea of the contents of the papers, and be brief.

LEVELS OF LAND AND SEA.

In a paper on this subject in *Science Progress* for October, Sir Charles Close states :—' Since the level of the sea is subject to long-period fluctuations, it will be most desirable to keep the Ordnance Survey tide-gauges at work for many years to come, in order to watch the changes in our only available datum surface ; the old levelling of 1840-60 is not reliable

enough to base any conclusions upon with regard to variations of land-levels ; the new levelling is of great accuracy and should afford a sure foundation for future discussions ; there is possibly a real increase of a few inches in the height of the sea surface above the geoid from south to north, along the coast of England and Scotland ; and, finally, there is no evidence that the levels of England have altered since the earliest exact observations (about 1840), such evidence as there is tending to show that, if there have been any vertical movements of the crust, they must have been very small. But fifty or a hundred years hence it ought to be possible to investigate these, and allied problems, with much greater accuracy than can be done at present.'

ESSEX NATURALISTS.

The Essex Naturalist for April to September is characteristically full of valuable papers of interest to Essex workers, which is as it should be. There are numerous plates and other illustrations, and at the price of 7/6 the publication is not unreasonable. Besides the usual reports of the Club's activities the Journal contains the following :—'The Fungus Root (Mycorrhiza),' by Robert Paulson ; 'The American Grey Squirrel in the British Isles,' by Hugh Boyd Watt ; 'Richard Warner,' by the late Professor G. S. Boulger ; 'Scattered Bird Notes from the Walthamstow Reservoirs,' by Johnson S. Jeffree ; 'Mrs. Berkeley, of Spetchley,' by Ellen Willmott ; and 'The Vange Mineral Wells and Water,' by William Whitaker and John C. Thresh.

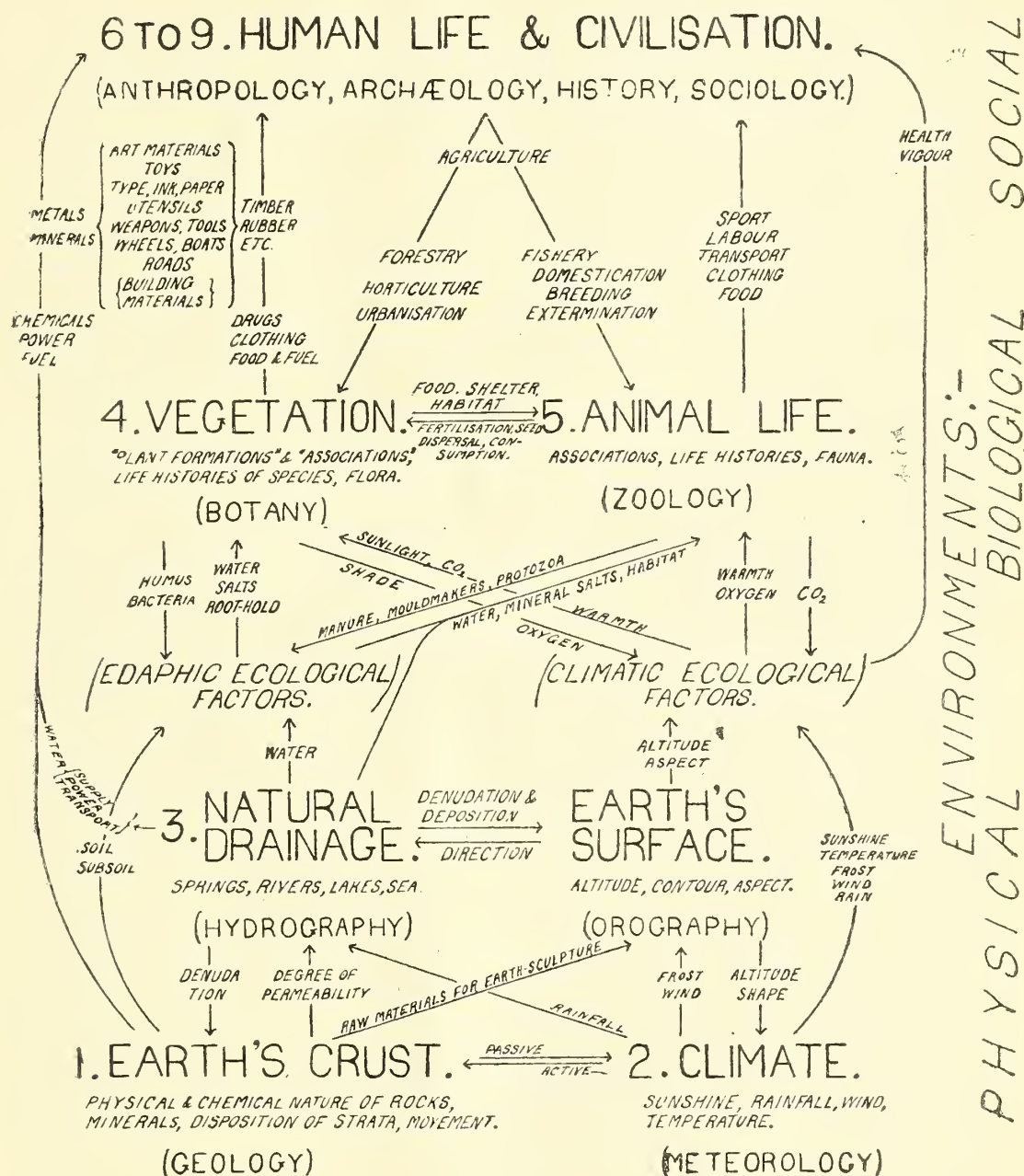
ORNITHOLOGICAL BIBLIOGRAPHY.

Mr. K. Kirke Swann has issued a 42-page supplement to his 'Bibliography of British Ornithology from the Earliest Times.' This consists of a Chronological List of British Birds, and gives the names of all the species and sub-species of birds on the British list arranged in order of the dates when they were first scientifically described, the work in which the description and accepted specific name first appeared being indicated. In brief, it is an attempt to summarise the history of the names of British birds. As regards species, Linnæus in 1758 enumerated 533, of which 204 are on the British list, while in 1840 about 6000 species were known. At the present day, counting in all the geographical races, the number is immensely greater. The B.O.U. list (second edition, 1915) admits 475 on the British list, but does not enumerate many geographical races.' The publication is issued by Messrs. Wheldon and Wesley at 5/-.

CROYDON NATURALISTS.

'*The Proceedings and Transactions of the Croydon Natural History and Scientific Society*, covering the period February,

1921, to January, 1923 (186 pp., with Appendix, 5/-) is largely a monument to the industry of the President of the Society, Mr. C. C. Fagg. It contains his Addresses entitled 'The Recession of the Chalk Escarpment and Development of Chalk Valleys in the Regional Survey Area,' and 'The



Significance of Freudian Psychology for the Evolution Theory.' With the general question of Regional Survey one naturally associates the name of Mr. Fagg, who has done so much in this direction in the area in which he lives. The Diagram, illustrated herewith, entitled 'The Material of Regional Survey,' will give an idea of the method adopted by the Society in its work, and we are also kindly permitted

to reproduce the charming sketch entitled 'Regional Survey,' (Plate VI.), which is from a pencil sketch of Indian life, by Miss Dorothy Laucher. The other papers in this valuable publication are: 'Note on the Occurrence of *Ophioglypha wetherelli* in the London Clay at New Malden, Surrey, by A. G. Davis; 'The Process of Meandering, with Special Reference to the Upper Mole,' by G. T. McKay; 'Geology and Palæontology of the Lower Chalk in the Regional Survey Area,' by A. C. Davis; 'The Weather and Vegetation, 1921 and 1922,' by J. Edmund Clark and L. F. Hammond; and 'Report of the Meteorological Committee for 1921 and 1922,' by F. Campbell Mayard.

GEOLOGICAL COMMITTEES AT THE BRITISH ASSOCIATION.

If we may judge from the number of committees and the amount of grants received by Section C (Geology) at the British Association, it is certainly the most go-a-head of the various sections. The committees are:—'The Old Red Sandstone Rocks of Kiltorcan, Ireland'; 'To Excavate Critical Sections in the Palæozoic Rocks of England and Wales'; 'The Collection, Preservation, and Systematic Registration of Photographs of Geological Interest'; 'To consider the preparation of a List of Characteristic Fossils'; 'To investigate the Flora of Lower Carboniferous times as exemplified at a newly discovered locality at Gullane, Haddingtonshire'; 'To investigate the Stratigraphical Sequence and Palæontology of the Old Red Sandstone of the Bristol district'; 'To investigate the Quaternary Peats of the British Isles'; 'Comparison of the Rates of Pre-Cambrian and presumably Pre-Cambrian Inliers of England and Wales and the Dublin Area with the Rocks of the Morva Complex of Anglesey, with a view to possible correlation'; 'To Investigate Critical Sections in the Tertiary Rocks of the London Area.' 'To tabulate and preserve records of new excavations in that area'; 'To attempt to obtain agreement regarding the significance to be attached to Zonal Terms used in connection with the lower Carboniferous'; 'To co-operate with other Sections interested, and with the Zoological Society, for the purpose of obtaining support for the Zoological Record.'

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Wonders of the Sea-shore, by J. H. Crabtree, F.R.P.S. (Epworth Press, 90 pp., 1/6 net). This is a neatly got up little book with an attractive appearance. It is illustrated by photographic reproductions on ten plates, each plate representing one of the ten sections into which the letterpress is divided. The author indicates that the work is written for 'boys and girls.' If it succeeds, with young folks, in arousing enthusiasm for a deeply interesting subject, too much neglected, the book will not be issued in vain. It has, however, no real scientific value and even for 'boys and girls' is only *approximately* reliable.

Naturalist

EAGLES FORMERLY NESTING IN YORKSHIRE.

FREDK. J. STUBBS.

ALTHOUGH in mediæval days the eagle was a well-known English bird, there are few records of actual nesting places. By far the most important is the careful account of a nest in 1668 in the Woodlands Valley in Derbyshire. This description is generally said to be by Willughby. The only reference I have is in Ray's 1713 edition of 'Synopsis Avium,' where there is a full description of the nest, with an addled egg, and one youngster as big as a goose; 'tibiis ad pedes usque plumosis,' which proves it to be the Golden Eagle, and not the White-tailed Eagle. In the summer of 1668, Ray was staying with his old friend, Jessop, at Broomhall, near Sheffield, only a few miles away, and most probably the description of the Woodlands eyrie is by Ray himself. He refers also in the 'Synopsis' to the annual nesting of the Golden Eagle in Snowdonia, but does not mention the fact that the bird bred in Westmorland, information transmitted to him by Audrey ('Corr. John Ray,' p. 257).

At or about this time, in a secluded valley ten miles from the Woodlands locality, there is strong reason for believing that Golden Eagles had another eyrie. The evidence is not ornithological, but is fully as sound as that relating to North Wales (*cf.* 'Fauna of North Wales,' by H. E. Forrest, p. 227), although not so well detailed as the history of the birds in Westmorland, Cumberland and North Lancashire (*cf.* 'Fauna of Lakeland,' Macpherson, pp. 186-193). The exact Yorkshire site was on a precipitous cliff called Ravenstones, in the parish of Saddleworth; to-day, in spite of tremendous changes, the place remains one of the least-visited corners of the county. Aikin, in 1794, refers to the Greenfield Valley as 'romantic and almost uninhabited'; while Whittaker, in his 'History of Whalley,' calls Saddleworth a 'remote and a barbarous tract.'

Greenfield Valley is a great cul-de-sac surrounded by bare moorlands, and Ravenstones, 1500 feet above sea level, forms one side of Seal Bark, a deep rocky clough, famous in local botanical annals.* Judging from authentic eyries seen elsewhere, this Saddleworth cliff appears far more suitable in every way than the Woodlands locality. In 1668 a pack-horse route passed through Woodlands, and there were many houses in sight. At this date, so far as I can learn, none of the Saddleworth tracks passed through the Greenfield valley,

* *cf.* Davis and Lees' 'West Yorkshire,' pp. 231-2, for description of this Clough. There is a second 'Ravenstones' two miles away.

and it is doubtful if there were any inhabited houses. The present main road, passing from Greenfield by Wessenden Head (rising to about 1600 feet) to Holmfirth, is little more than a century old. Even to-day, in a distance of over six miles, not more than three or four houses are within sight of the road.

Saddleworth, as is well-known, was visited by Ray, who records the Parsley Fern at Knotty Lane, and the Bald Money at Scholefield Hall a few miles away: both these plants are extinct to-day. In the 17th and 18th centuries, Saddleworth was densely wooded and sparsely inhabited. Contemporary accounts on the natural history side are lacking, but there are several casual references to birds or mammals which may be used as criteria for judging the nature of the landscape. For example, an old hunting song relating to Greenfield (published in Harland's collection of 'Lancashire Ballads') gives the history of a Saddleworth huntsman called Gartside, mentioning his mastery over

'The crafty fox, the timid hare,
The kite that skims so blythe in air,
The falcon swift, the grovelling mole,
The marten sleek, the moping owl'

The exact date of this poem is not known, but the writer is obviously speaking of forms of life familiar to him. The marten seems to have lasted until 1816, when Lieut. Jas. Bottomley mentions that hunting the fox and the marten amongst the wooded rocks was a favourite sport of Saddleworth people. The marten now is utterly forgotten in the parish; and the thirty or forty years which have elapsed since the last specimen seem to have erased all memory of the polecat, a familiar beast which was regularly hunted in the district.

The first item of evidence relating to the Eagle is in a work called 'Greenfield: A Poem,' first published about 1790. A second edition (the only one I have seen) appeared in 1816. The author was Samuel Bottomley, who came of an old Saddleworth family. He was born there in 1738, dying in 1795. The poem can well be judged by the critical fragment that I quote below. The work is an account of the natural beauties of Greenfield, describing the prominent objects of the landscape, and giving a rather ambitious version of the local fairy tale of Rimmon and Alphin. To my mind, the treatment of the theme generally proves that Bottomley, writing as he was for a local audience, was adhering closely to popular views held by his neighbours. The stanza is taken from p. 7 of the second edition.

'Or in the clouds famed Ravenstones explore
There boisterous Boreas makes the caverns roar;
There on a cliff, dark-frowning to the eye,
Imperial eagles build their nests on high;

Through Heaven's expanse they cut their trackless way,
Or dart like lightning on their destined prey,
A bleeding victim from the bleating flock
Has oft been mangled on this towering rock ;
Bold was the man who, hanging o'er the vale
To seize their young, the dangerous cliff dared scale.'

This, of course, is pretty definite. If an invention, it is the only one in the book (for the tale of Rimmon and Alphin is offered simply as folklore). The word 'build' should perhaps be 'built'; beyond this, the whole tale is plausible. Corroborative evidence, up to now, is scanty, but yet not without value. In Vol. I. of the 'Saddleworth Church Registers' (1887), p. 422, there is a short biographical sketch of John Lees, one of the Vicars of the parish, who died at a great age in 1712. The editor quotes the testimony of Mrs. Radcliffe, an old lady living at Stonesbreaks in 1828, who said that in Lees' day Saddleworth was a wilder place—'Foxes were common, otters frequented the Chew and the Diggle, and eagles were seen in the retired cloughs.' The whole passage is ambiguous, and appears to be taken from some unpublished MS. in Canon Raines' collection. As a matter of fact, foxes bred at Chew as late as 1894; 'otters' is spelt 'others,' and 1728 instead of 1828 is given as the date of James Butterworth's 'History of Saddleworth.' Butterworth, a careful and experienced historian, naturally mentions Dovestones and Ravenstones, saying 'the latter of which appears the more tremendous of the two, but from the top of which a person descended by means of a rope, for the purpose of taking a young eagle's nest, in which project he succeeded.' Butterworth clearly accepts the tale as fact. The important point is not the presence of eagles, but the adventure of robbing the nest; whether he was using Bottomley's poem, or was availing himself of oral tradition, is not very important. A much later writer, Joseph Bradbury, in his 'Saddleworth Sketches' (1871), quotes the story without any thought of its probability or otherwise, but brings no fresh evidence.

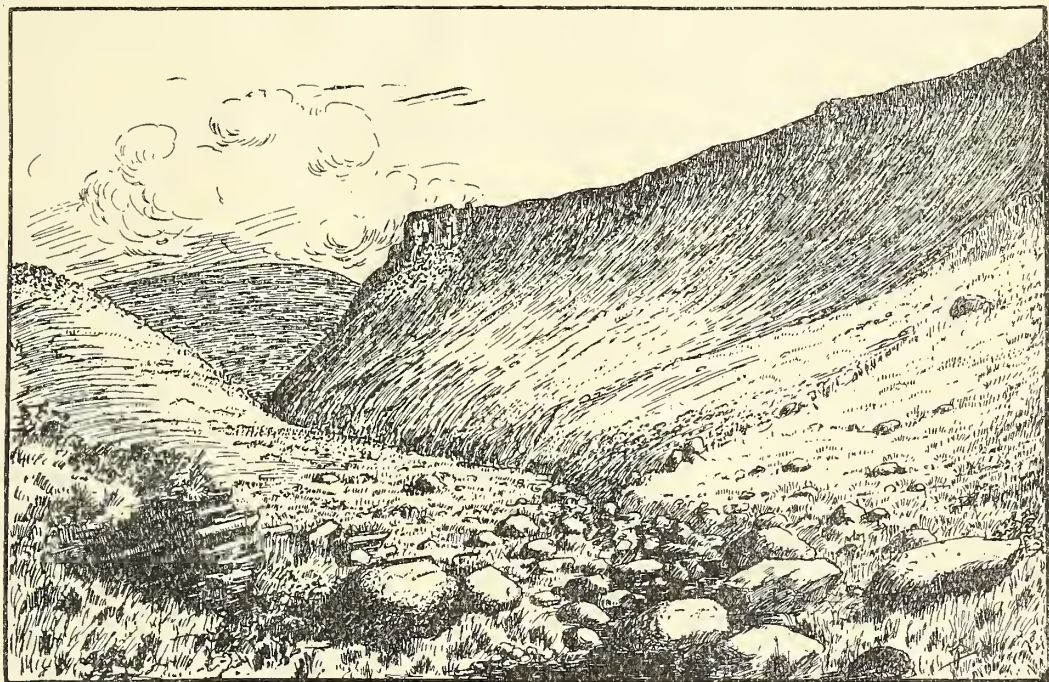
So far as I can gather, local remembrance of the tradition has quite died out in Saddleworth. This means but little, for I found the same local ignorance in Woodlands of the former presence of eagles in that district. When Bottomley wrote, no particular glamour could be attached to the eagle. A century before his day, as we know from Ray, the Golden Eagle certainly bred no more than ten miles away. It is impossible for me to learn when this Derbyshire eyrie came to an end. A bird was caught alive in 1720 on the flanks of Kinder Scout (which abuts on Woodlands), the fact being remembered mainly because this eagle was shown in a sort of travelling menagerie. The White-tailed Eagle, during the past century, has been by far the better known species

visiting the Pennines. In 1921 I had myself the pleasure of seeing this species in the Derwent Valley, a mile or so from Woodlands ; and there are many records both of this species and the rarer Golden Eagle for the four Pennine counties (*cf.* 'Birds of Yorkshire,' I., 331-342 ; Jourdain, 'Vict. History of Derbyshire,' I., 135 ; the 'Zoologist,' 1845, p. 1022 (Cheshire) etc.).

A well-known Act of Elizabeth's time (8 Eliz. c. 15), authorized churchwardens to pay rewards to the destroyers of ravening birds and other vermin. This Act throws a most interesting light on the English fauna of that period. 12d. was to be paid for the head of a fox or a gray [badger], but only 4d. for 'every Iron or Osprayes head.' Does this imply that eagles were commoner than foxes, or merely that they were less harmful? The Act specially protects Kite or Raven within two miles of a town, because of their value as scavengers. 'Iron,' of course, is the same as 'Erne,' a frequent mediæval name for the eagle. Over the hills, three or four miles from Ravenstones, there is the wild valley of Arnfield, and the still more secluded spot called Iron Tong, or (in the present Ordnance Map) 'Irontongue Hill.' Without doubt these names relate to the former presence of the bird, but one cannot be so sure with regard to lowland local names like Earnshaw or Ernicroft. In some parishes, the Churchwardens Accounts, where preserved and examined, have thrown much light on the fauna of past centuries. Unfortunately, the Saddleworth series appears to be lost.

In attempting to estimate the amount of credence to be given to Bottomley's account of these Yorkshire eagles, care must be taken to make every allowance for a country changed, and changing, beyond recognition. Mere chance alone has preserved the record of the Derbyshire eyrie. As I say, Saddleworth was, in the 17th and 18th centuries, more rugged, as well wooded, and as sparsely peopled as the Derwent valley. Using such forms of life as marten, polecat, kite, or raven as criteria, we may form some idea of the past nature of the scene. We must omit all thought of the numerous roads, railways, and canals now crossing this wild district. Even to-day, within a dozen miles of Ravenstones, there are perhaps not fewer than one hundred square miles of totally uncultivated and uninhabited moorland, in an almost unbroken area. In 1700 the only road was eight to ten miles away, connecting Stockport with Manchester and Rochdale. Birds described as 'the last of the Saddleworth Ravens' were included in the sale of a Chadderton naturalist who died in 1892 ; but Saddleworth is not mentioned in connection with the Raven in the 'Birds of Yorkshire,' nor is it the only omission. This great parish, even to-day, is curiously

isolated, and its neglect by county historians is remarkable. The reason is not difficult to guess. It is cut off from the rest of Yorkshire by the formidable rampart of the Pennine plateaux, devoid of passes, and until the middle of the 18th century uncrossed by roads. We know very little about the English history of the Golden Eagle. Possible, if hardly probable, is the idea that this great bird may have lingered



Ravenstones, from the west.

in Saddleworth later than it did anywhere else ; and, perhaps, some student going deeper into this fascinating subject may be able to add substantial evidence to the simple record I herewith present.

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No. 87 of the *American Museum Novitates* contains a description of 'A New Genus of African Monkey, *Allenopithecus*,' by Herbert Lang.

Nature is continuing its method of issuing special supplements, and in this way recent issues contain 'The Life History of an a-Particle,' by Sir Ernest Rutherford ; 'A Report of the British Association Meeting at Liverpool' ; and 'Recent Scientific and Technical Books.'

An account of the Museums Association excursion to Copenhagen, together with a discussion on Mr. T. Sheppard's Presidential Address on 'The Place of the Small Museum,' occur in *The Museums Journal* for October. With this part is issued an index to Volume XXII., kindly prepared by Mr. E. Rimbault Dibdin.

The New Phytologist for September is a substantial publication and contains the following papers :—'Variation as an Organic Function,' by C. W. Soal ; 'Meristematic Tissues and Protein Iso-electric Points,' by W. H. Pearsall and J. H. Priestley ; 'Content, Methods and Measurements in the Teaching of Elementary Botany,' by F. E. Clements ; and 'Permeability,' by W. Stiles.

FIELD NOTES.

FLOWERING PLANT.

Claytonia Sibirica in the Ryburn Valley.—This introduced plant is making great headway in our woods, and for many years it has flourished along the streamsides on both banks of the Ryburn. It seems as well established now as is the Sweet Cicely and Bistort. Large patches occur on beds of silt and sand left by heavy floods under the overhanging dripping rocks about Thorpe and other suitable habitats, where the numerous pretty pink blossoms provide an annual source of beauty in the early summer.—JOE FIRTH, Triangle, Halifax.

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MAMMALS.

Local Increase of the Red Squirrel.—Many records have recently appeared relating to the native red squirrel and the American grey species, the former usually recording decreases in the numbers. This back end, at Denton, on the side of the Wharfe, they are now almost as plentiful as I ever remember them to have been there; in fact, in this part of Wharfedale (including Bolton Woods), there appears to be rather more of them about. Last Sunday, for the first time for several years, I saw one in Ben Rhydding. I only hope these are 'straws that show which way the wind is blowing,' and that the tide is turning, so that our 'bonnie little beastie' may become generally common again to enliven and brighten our woodlands.—H. B. BOOTH, Ben Rhydding.

Skull of Rorqual from the Irish Sea.—Under the heading of 'A Mammoth's Shoulder Blade,' *The Yorkshire Post* for the 3rd instant contained the following note:—'A trawler yesterday landed at Douglas (Isle of Man) part of the remains of a prehistoric monster which had been brought up in a trawl off Ramsey. The bone is supposed to be the shoulder blade of a mammoth. From the back to the end of the blade is 6 ft.; the bone is 2 ft. thick and over 3 ft. wide.' It was obvious that this must be part of a whale; and since then I have received photographs of the object from Mr. G. B. Cowen, which clearly indicate that, as was expected, the bone is the remains of a large skull of a whale. Sir Sidney Harmer, who has since seen the photographs, is not sure of the species, but judging from the size, etc., considers that the animal is probably a Common Fin Whale (*Balænoptera physalus*). A very similar skull, taken into Grimsby by a trawler, was figured in *The Naturalist* for May last, page 166; but in this instance the daily press considered it to be the skull of an ichthyosaurus, thrown up by a volcanic eruption!—T. SHEPPARD, October 10th.

THE LEEDS GEOLOGICAL ASSOCIATION JUBILEE.

THE Leeds Geological Association celebrated the fiftieth year of its activities on Saturday, October 13th. The organisation owed its origin to the stimulus of some University Extension lectures delivered in Leeds fifty years ago by Mr. W. J. Sollas, now Professor of Geology at Oxford, and the Council was able to secure the presence of Professor Sollas to deliver an address on the thirteenth.

The proceedings took place at the Leeds University. During the afternoon a reception was held by the President, Mr. F. W. Branson, Miss Branson, and Professor Sollas. A very interesting exhibition had been arranged in the Physical Laboratory, the principal features of which were exhibits illustrating the work of members of the Association. An hour was pleasantly spent by a large company in inspecting the specimens, and subsequently tea was served in the refectory.

The President briefly welcomed Professor Sollas and congratulated the Society upon the attainment of its fiftieth birthday.

Mr. E. Hawkesworth referred to some of the workers of past generations, his memory carrying him back over 37 years of the society's work.

Mr. Waterworth, President of the Halifax Scientific Society, claimed that his organisation was a twin brother of the Leeds Geological Association. Although they were not celebrating their fiftieth anniversary until next year, the Halifax society also arose out of the Geological enthusiasm created by Professor Sollas's lectures in West Yorkshire.

Colonel Kitson Clark, on behalf of the Leeds Philosophical Society and a considerable number of representatives of other organisations present, added congratulations to the Leeds Society.

Professor Sollas congratulated Leeds upon the happy way in which the professional geologists at the University had been able to associate themselves with, and offer valuable stimulus to, the amateur workers in geology.

In the evening Professor Sollas delivered an address upon 'Fifty Years of Geology.'

He devoted his address to an account of some of the discoveries of the first magnitude in geology during the past half century. Fifty years ago one of the great puzzles of British Geology was, he said, the succession of the strata in Sutherlandshire. The explanation arrived at by Charles Lapworth, one of the most real geniuses that Geology has known, was that great flakes of enormous size had been 'shoved' forward over the surface of other rocks to a distance of several miles. That conception had been fertile in explana-

tion of the structure of the mountain ranges of the world, especially in the Alps, where the phenomena of rock movements are seen on the grandest scale. That was a discovery of facts ; the explanation of the facts had not yet been arrived at.

Prof. Sollas went on to remind his audience that William Smith, the Father of English Geology, had set forth the theory that rocks could be identified by the fossils they contained. He proceeded to review the work which had been done by Quenstedt in the sub-division of the Mesozoic rocks by their ammonites ; and by Charles Lapworth in the sub-division of the Palæozoic rocks by the graptolites. He observed that there were now thousands of horizons recorded, each distinguished by its own particular fossil. He rejoiced in the number because it was now impossible to make students learn them all. He held that it was no use teaching knowledge on the off-chance that it might be useful, even though it was not likely to be. That was formerly done greatly at Oxford and Cambridge, and was what made Samuel Butler call them ' the Colleges of Unreason.' It was easy enough to ' get up ' the zones when a particular piece of work was in hand.

Great advance had been made in the study of earthquakes, particularly through the work of Milne in recording earthquakes, and by Oldham in the interpretation of those records. Oldham had shown that beside the ' waves of compression ' which were the first results of an earthquake, there were transverse ' waves of deformation,' This was a great discovery enabling them to examine the interior parts of the earth, for the waves of deformation could only be transmitted in rigid materials. The outcome of the work done on these lines was a conviction that the earth is more rigid than steel half way to its centre. The remaining half is not solid, though it is impossible yet to say in what condition it actually is.

The discovery of radio-activity had overturned previous conceptions in Geology more perhaps than anything else. Uranium and Thorium were now known to be always disintegrating and giving out heat in that process ; and one of their products, Radium, was itself disintegrating. They knew now by the experiments of an Irishman of brilliant genius what was the percentage of radium contained in the rocks of the earth's surface, and it was apparent that if radium was present in the same percentage in the whole of the material of which the globe was composed and was disintegrating at the same rate, the earth ought to be getting hotter, and the inevitable conclusion was that it would one day melt from centre to surface. There would be a terrific explosion blowing the globe into fragments which would continue to revolve round the sun like the Planetoids. Prof. Sollas explained the

work of Joly, which calmed anxieties on this point, making it clear that such a catastrophe was highly improbable.

Radio-activity had given rise to interesting speculations on the age of the earth. Little more than fifty years ago, Lord Kelvin startled geologists by saying that one hundred millions of years was the greatest duration of time that the physicists could allow for the whole of the processes of the evolution of the earth. That was on the basis that the earth had been originally a mass of white-hot metal radiating its heat into space. Of course Geology could not do with such a period as that, but it was now known since radium was discovered that the earth was not in the condition postulated by Kelvin, for the radium was producing as much heat as the earth was radiating into space. Then another point was raised. The final product of the disintegration of radium was lead. Calculations based upon the rate at which the radium in the earth's surface was being converted into lead gave them not one hundred millions, as Kelvin said, but sixteen hundred millions as the period occupied in the evolution of the earth. Geologists, however, were not compelled to adopt even this conclusion. It was just possible that in the earlier conditions of the cooling of the earth, uranium was disintegrating faster than the disintegration that we were able to detect to-day. There were evidences which showed that the rate of the disintegration of radio-active materials should be represented graphically, not by a straight line, but by a curve.

Prof. Sollas devoted the latter point of his address to a description of the great advances of knowledge which the last half century had yielded in the sphere of prehistoric man.

During the proceedings Professor Gilligan, on behalf of the students of the University, presented a silver rose bowl to Mr. H. C. Versey, Secretary of the Association, on the occasion of his recent marriage.—H.E.W.

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In *The Animal World* for October, Clifford W. Greatorex discusses the question 'Is Nature Cruel?'

In *The Irish Naturalist* for October Dr. R. Lloyd Praeger writes on 'Ireland and Switzerland: A Botanical Contrast.'

In the *Fishing Gazette* for September 22nd, Mr. Richard Mason has an article on 'Barbelling from the Bank in the Lower Trent.'

W. J. Lucas contributes 'Notes on British Neuroptera (including Megaloptera and Mecoptera) in 1922,' to *The Entomologist* for October.

We have received a copy of *Museum Work*, issued by L. V. Coleman, and published by the American Association of Museums; a useful publication.

F. W. Edwards has a note on 'Some British Species of Microdon (Diptera, Syrphidæ) in *The Entomologist's Monthly Magazine* for October, and in the same journal G. B. Walsh records that the Gooseberry Sawfly is particularly abundant in the Scarborough District.

YORKSHIRE BOTANISTS.

CHRIS. A. CHEETHAM.

ONCE again the Botanical Section of the Yorkshire Naturalists' Union was indebted to Prof. J. H. Priestley, and the authorities at the Leeds University, for the privilege of meeting in the Botanical Department on the occasion of the Annual Meeting of the Botanical Section on Saturday, October 6th. The date proved rather early to report to best advantage on the extraordinary results of this year's fruiting. A very generous response had been made from all parts of the county to the Secretaries' enquiries, and these, together with the discussion at the meeting, emphasized the abnormalities, cases of practical absence of fruit such as Larch, Oak, Hawthorne, Pear, etc., being met by fair crops of Bramble, Mountain Ash, Elder and Rose. In some cases it was thought the cause dated back to the hot summer of 1921, when well-ripened wood produced abundant fruit in 1922, with a result of depleted energies this year. The matter is dealt with in the Report.

Officers for the Section and its Committees were suggested for election at the Annual Meeting of the Union.

During the interval between the afternoon and evening meetings, a welcome cup of tea was provided, through the kindness of Mrs. Priestley and Mrs. Pearsall, the spare time was used to inspect an exhibit of Peat which Mr. W. H. Burrell had brought from the deposit on Cross Fell, described by Lewis. The larger materials—stems, leaves of willows, etc.—could be seen in the fresh material, and the minute contents were exhibited under the microscope. Mr. F. E. Milsom showed examples of some of the additions to the Hepaticæ of the county, including *Anastrepta orcadensis*.

At the evening meeting Prof. Priestley brought a series of papers on work done in the department by some of his students. The first, by Miss Hinchcliffe described the fat content of peat-loving plants. This has been partly dealt with in *The Naturalist*, 1922, p. 263, and further suggestive facts were brought forward. Samples of the oil extracted were shown, this being found to be of a drying type, the dry product being a good varnish.

Miss Whitfield's paper on the potato was prefaced with some interesting historical notes, especially referring to the original difficulties found in cultivation, where seedlings could not be depended on to give tuber-producing plants, the analogies between potatoes and orchid tubers were discussed, and Bernard's work warmly commended.

Miss Hanby's work dealt with the shapes of the submerged leaves of water plants. Dr. Pearsall, who exhibited the plants produced in the experiments, said the results pointed out that, in addition to the effect of light, the available supply of bases greatly influenced the ultimate shape of the leaves.

Miss Ford's paper showed that the extra length of the growing point, and the presence of an endodermis in submerged plants, was very suggestive of plants grown in the dark. It is to be hoped that some of this work will be recorded in our journal. The meeting terminated with a vote of thanks to Prof. Priestley for the trouble he had taken to make the meeting such a success.

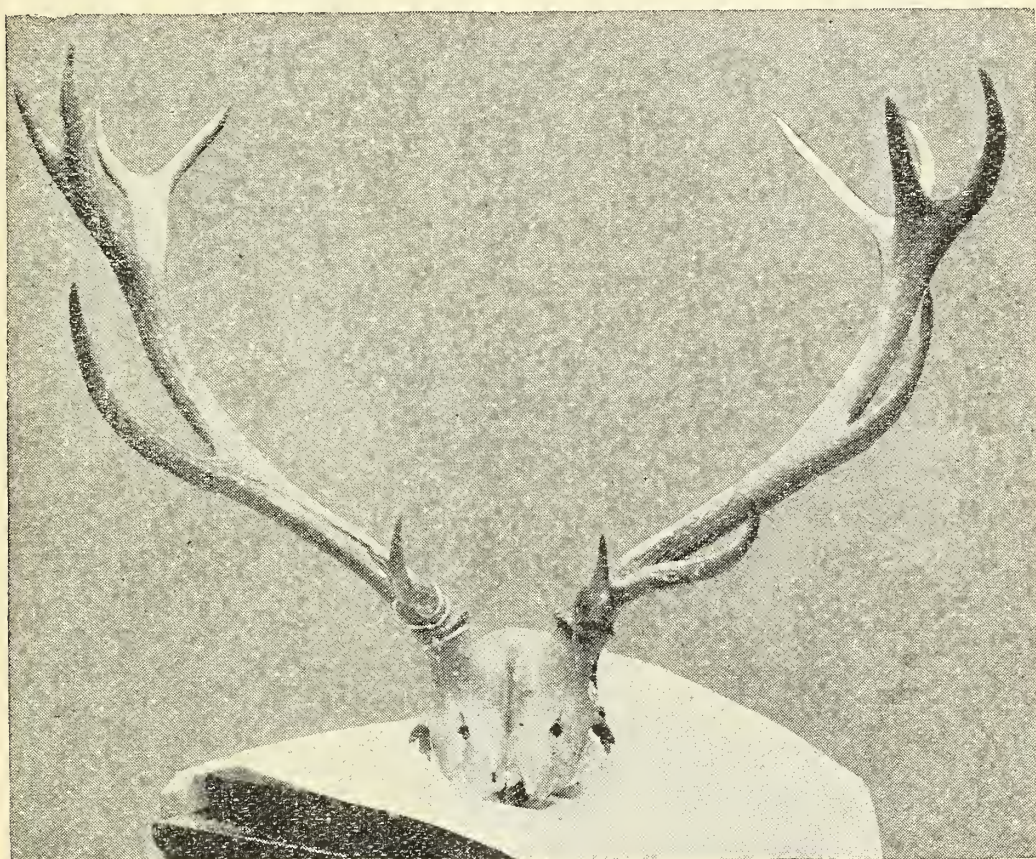
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The South Wales Coal Annual, 1922, edited by C. P. Hailey and D. Wilson Lloyd, and published by the Business Statistics Company, Ltd., Baltic House, Cardiff (12/6 net), is a substantial volume of over 300 pages, containing statistics relating to anthracite coal, patent fuel, coke, peat, wood, conveyance charges, list of collieries, prices and various other information likely to be of service to those interested in the coal trade.

RED DEER SKELETON FROM THE HOLDERNESS PEAT.

T. SHEPPARD, M.Sc., F.G.S.

A LITTLE while ago we heard of a skeleton of a Red Deer having been obtained in the peat exposed on the shore near Skipsea, East Yorks. It was found by Mr. W. Southwick, who first noticed the antlers showing just above the peat, having been exposed by the sea. He then spent a considerable time in carefully removing the entire skeleton, which, from its position



Pair of antlers of Red Deer found in the Peat north of Hornsea, together with the complete skeleton, now in the Hull Museum.

with its legs drawn underneath the body, had apparently become immersed in the bog and unable to extricate itself. With the exception of some of the very smallest bones, every part of the skeleton was secured, and it has recently been mounted and placed on exhibition in the Natural History gallery at the Municipal Museum at Hull.

The antlers are generally symmetrical, but one contains seven points and the other six, the length from the farthest point to the corona being 2 ft. 3 ins. and 2 ft. 2½ ins. respectively. They are 7 ins. in circumference at the point of attachment to the skull.

Almost at the same time a similar discovery was made in

the peat on the shore immediately north of the pier at Withernsea. Unfortunately in this case the antlers were only observed



Skeleton of Red Deer found in the Peat north of Hornsea, E. Yorks.

at very low water during spring tides, and consequently the opportunity of excavating was very brief. The two antlers, however, were secured, attached to each being a part of the

skull, and it seems quite probable that the remainder of the skeleton is still buried there, but as on the following spring tides the site was covered up with sand, it will be difficult, if not impossible, to obtain the remainder of this skeleton. Unfortunately the upper portion of the left antler was broken during the operation of extracting the specimen from the peat, and could not be found.

The right antler is perfect, but, as will be seen from the photograph, the two differ considerably in their construction.



Red Deer Antlers from the Peat at Withernsea.

The right antler measure 33 ins. at the greatest length ; there are eight points; the third one from the skull having been broken some time previous to burial, as the fracture is well rounded. The brow-tine measures 13 ins., the second tine measuring 12 ins. The circumference round the antlers near the skull is 9 ins.

On the left antler there are four points preserved, and the broken portion may represent two or possibly three others. In this case the brow-tine is considerably longer and stronger than the second one, though the latter has been slightly broken at the point during the lifetime of the animal. Some of the points of these antlers are remarkably polished and smooth.

With the help of Mr. J. W. Marshall this example is now in the Hull Museum.

ANTHROPOLOGY AT THE BRITISH ASSOCIATION.

E. N. FALLAIZE.

SECTION H (Anthropology) met in the Museum under the presidency of Professor Percy E. Newberry, who took as the subject of his Presidential Address 'Egypt as a Field of Anthropological Research,' a topic upon which, curiously enough, no previous President has touched. He discussed at some length the question of the origins of Egyptian civilisation, which he maintained were the result of the meeting of East and West—Asiatic and Libyan—in the Delta at a time long anterior to Menes. Egypt was, he said, a storehouse full of the remains of Man's industry from pre-agricultural times right down to the present day.

Two organised discussions formed part of the proceedings, but unfortunately the co-operation of other sections interested in the subjects of debate was possible in one case only. In a joint session with Section E. (Geography), Professor J. L. Myres opened a discussion on 'The Place of Man and his Environment in the Study of the Social Sciences.' After referring to the anomalous position of certain Sections of the Association which dealt with specifically human activities as branches of science side by side with a Section which dealt with Man and his activities as a whole, he propounded for discussion the question whether sociology was to be regarded as a pure science or as a study which had to take *values* into account. The discussion which followed was of a somewhat one-sided character. Dr. M. Newbigin, Professor Fleure, Mr. Thoothi, and Sir William Beveridge spoke with varying emphasis in favour of the employment of the objective method of study, but Mr. Julian Huxley put forward the view that evolutionary biology acted as a link, and indicated the possibility of employing an observed line of direction in values as a norm in practical affairs.

The second organised discussion dealt with the origin of domesticated plants and animals, and was opened by Professor Newberry, who suggested that we must look to Asia, and possibly Syria, for the origin of the early domesticated animals and plants of ancient Egypt, but in view of the very defective state of our knowledge urged the need for further investigation. In regard to plants, in particular, he emphasized the importance of the careful study of weeds associated in different parts of the world with domesticated plants. Sir William Boyd Dawkins, Dr. Stapf, Dr. Brierley and Professor Elliot Smith took part in the discussion.

There was a welcome increase in the number of papers in ethnography, which have been somewhat deficient, both in

number and quality, since the war. Mrs. Routledge gave some of the results of her recent expedition to the South Seas in her account of Mangarevan folklore, tradition and history, of which much has been recorded in writing by the natives themselves. Mr. E. Torday dealt with inter-tribal commerce in West Africa, which, there was evidence to show, existed before the coming of the white man. Mr. W. E. Armstrong's account of the inhabitants of Rossel Island, New Guinea, was a valuable and well illustrated study of a somewhat peculiar type of culture. Baron Nopsca's account of house-building and house-implements in Northern Albania dealt with its subject matter on comparative lines, bringing it into relation to the broader aspects of problems of Balkan ethnology. Lack of space precludes more than a brief mention of Mr. L. W. G. Malcolm's paper on the belief in a plurality of souls in Ancient Egypt and West Africa, Mr. Bonser's examination of the magical practices of the Finns and their relation to other Arctic cultures, and Dr. A. C. Kruyt's analysis of the culture of the stone-using peoples of Central Celebes. Dr. E. Ekwall's paper on Lancashire place-names was instructive in the corroborative use made of archaeological and historical evidence.

Dr. J. Sampson contributed a valuable paper on the origin and early migrations of the gypsies, based upon the evidence of recently collected specimens of a Syrian-Romani dialect; while Mr. E. Torday, in his study of Hungarian folk-music, referred incidentally to the mark left by gypsies on Hungarian music, pointing out, however, that it was erroneous to say, as Liszt had done, that they originated it. His paper was accompanied by vocal and instrumental illustrations, the latter provided by a band of Hungarian gypsies from Budapest.

Among archaeological communications, the one of outstanding interest was Sir Arthur Evans' lecture on 'Crete as a Stepping Stone of Culture,' which included in a survey of the civilisation of Knossos, an account of some of the important discoveries recently made. In the prehistoric road, which Sir Arthur has now traced from Knossos to the south coast of the island, he finds an explanation of the close intercourse with Egypt, going back to predynastic times, for which this site has furnished evidence. This road obviated the perilous voyage by sea around the coasts of the island. Crete was the point where the primitive civilization of our Continent was first affected by the cultures of Egypt and the East. Its original affinities were with Anatolia; but the rise of Minoan Culture coincided with cultural contact with the Nile Valley, and possibly with the immigration of members of the Old Race driven out at the time of the dynastic conquest. Mr. Stanley Casson presented two communications dealing with

the archæology of the Mediterranean area, one on the North Argean coast in the Bronze Age, the other on prehistoric sites in the Dardanelles and Bosphorus. In the latter it was suggested that these sites, which belong to the neolithic or Chalkolithic period, indicate a greater importance for Troy I. and companion sites in the Troad than had hitherto been attributed to them.

Professor W. J. Sollas presented a paper on 'Miocene Man,' which, it was not surprising to find, gave rise to lively discussion. He has subjected to a very close examination the large collection of flints from Aurillac (Cantal), in France, made by the late Mr. A. Westlake, of Fordingbridge, and has also personally investigated the site from which they came. As a result he is convinced that the deposits are undoubtedly of late Miocene Age, while the form of the specimens resembles in a remarkable manner that of instruments made by design. He is unaware of any natural agencies by which, in this area at any rate, they could be produced, and they seemed to him to bear cogent evidence of design.

Eoliths were also the subject, both directly and indirectly, of communications by Mr. de Barri Crawshay, who gave an account of the life and work of the late Mr. Benjamin Harrison, and described recent investigations at the South Ash (Kent) pit which had produced eoliths. A small group of papers, collected in view of local interest, dealt with the prehistory of Wales. Professor Fleure gave a general review of the whole subject, indicating the special difficulties, particularly in the matter of dating, which confront workers in this area. Dr. R. E. Mortimer Wheeler described the hill-forts of North Wales and their historical background; Mr. I. T. Hughes gave an account of field work on the earthworks of Cardiganshire, and Messrs. Roger Thomas and Dudleyke described a prehistoric flint factory at Aberystwyth.

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BOTANY AT THE BRITISH ASSOCIATION.

W. H. PEARSALL, D.Sc.

THE proceedings of the Botanical Section (K) at the recent British Association meeting opened with an address by the President, Mr. A. G. Tansley, F.R.S., on 'Some Aspects of the Present Position of Botany.' Mr. Tansley pointed out that the botanical work of the last twenty years fundamentally affected the basic assumptions on which botanical research had been founded since Darwin's day. The ideal that anatomical research would enable us to reconstruct a great 'family-tree,' on which the ancestors of all the great groups

of plants could be identified, had proved to be unattainable. The fossil floras showed that these main types of plants remained quite distinct as far back as the records went, and types capable of being used as connecting links between the great groups appeared to be absent. Further, the post-Darwinian view that the existence of any structure could be explained if its *function* could be found, had also broken down. The greater number of field naturalists were agreed that the differences between species had usually no functional significance. One by one, in the light of critical examination, many, or most of the explanations of supposed adaptive structures and arrangements had broken down, and these structures had been shown to possess no function, or to work in a different way from that required if they were to have any survival value. It, therefore, was clear that the origin of specific and generic differences had usually to be sought along other lines, and by employing other methods. A third line of attack, by breeding methods, has shown quite definitely that the small fluctuating variations of a species are not inherited. The rediscovery of Mendelian phenomena, and their justification over a very wide field, has enabled us to build up a fairly accurate idea of the mechanism of inheritance. This—while not necessarily destroying the Darwinian views—has demonstrated clearly that the main problem of evolution is the process of variation itself (how variations are caused), and not what happens to the variations after they have appeared.

New variations arise by dropping out or recombinations of the chromosome determinants (*genes* as they are called), and the variations produced persist without any reference to selection. The idea that all new characters are of survival value, or that they owe their origin in any way to selection, is not only unproved, but finds absolutely no support in the evidence.

In the present state of knowledge it is not wise to reject the possibility of other methods of species formation. The possibility exists that new *genes* may be created or altered by the long continued action of the environment, but this side of the problem has not yet been successfully attacked. Our given type of organism must be regarded as being built up on a basis of certain theoretically indispensable *genes* of whose exact nature we know little. On this basis, the organism develops to maturity through long and complicated processes of physical and chemical interaction between the *genes* and their derivatives, between the substances and structures of the developing organism and between these and their environment. Of these complex developmental processes we know extraordinarily little, and it is to this field that both morphologists and physiologists must direct themselves before

much further advance is possible. Professor Lang sketched the lines along which such investigations should proceed some years ago, and Professor Priestley and his collaborators have recently attacked with considerable initial success the sequence of events leading to the differentiation of certain plant tissues. Many may think that such characters are common to plants in general, and hence are useless in seeking to explain the differences between groups of plants. If, however, we can get a clear idea of the way in which the plant complex develops, by following the detailed processes which lead up to the appearance of a structure, we may perhaps ultimately understand how the *genes* can produce or modify the structure.

Dr. D. H. Scott, F.R.S., in his paper on the 'Early History of the Stele,' reviewed the fossil evidence as to the evolution of the vascular tissues in plants. He pointed out that the recently discovered Early Devonian fossils (*Rhynia*, *Hornea* and *Asteroxylon*), of much simpler organisation than any known fern, or fern allies, indicated that the stem vascular system was always an independent structure, and not one built up of a number of bundles from leaves.

Professor W. H. Lang, F.R.S., who described these fossils with Dr. Kidston, referred to the light they threw upon the organisation of the higher plants. They seemed to show that the Lycopod type of plant was already in existence in Early Devonian times (e.g., *Asteroxylon*), and also indicated that the fern type of plant with relatively large leaves might be derived from a whole branch system coming from a tuberous rhizome as in *Hornea*.

Mr. S. G. Jones described the life history and cytology of *Rhytisma acerinum*, and Dr. M. Wilson and Miss E. J. Cadman gave a similar account of *Reticularia Lycoperdon*. Dr. Muriel Roach is pursuing her studies of soil algæ, and described their behaviour when grown on various culture media.

Prof. V. H. Blackman, F.R.S., Mr. A. T. Legg and Dr. F. Gregory had confirmed the earlier field results of other investigators as to the effect of electric currents on plant growth. They found increased growth only in currents of low intensity, and got similar results with pot experiments lasting for six years, and also with special investigations on single shoots of barley.

A discussion on 'The Virus Diseases of Plants' was held by the Botany and Agriculture Sections. These obscure diseases have not been traced to any definite organism, but are of great economic importance. Dr. W. B. Brierley shewed the best statistics available, which demonstrated that in the U.S.A., twenty-two out of the forty-one States lost one million tons of potatoes from one of these diseases alone (mosaic) during 1918-1922. This is enough to feed 170,000 people during

that period. Similar, or larger losses, were known for other diseases and other crops. Dr. Paul Murphy analysed the evidence showing that these diseases are of the 'virus' type, and not merely ill-health conditions due to old age or unfavourable culture. In potato they can be transmitted from one plant to another, and they affect the plant by preventing starchy foods from being removed. Thus no food is available for tuber formation. Prof. H. M. Quanjer (the eminent Dutch plant pathologist) considered the evidence from another point of view, and regarded these diseases as diseases of the phloem, or food-conducting channels. The symptoms follow the downward flow of sap, and there is evidence that the diseases are spread by aphides sucking the phloem, or by leaf hoppers doing this. Professor Quanjer thinks the disease is caused by a micro-organism, though none have yet been isolated.

A second discussion between the Botany and Agriculture Sections took place on the last morning, when the subject was 'The Effect of Soil Sourness on Plants.' Mr. A. G. Tansley, who presided, summarised the historical development of this subject in his opening remarks. Dr. E. J. Salisbury took the view that the hydrogen ion concentration (acidity) of the soil was the chief factor determining the distribution of natural vegetation, giving evidence in support of this view.

Dr. N. M. Comber (of Leeds University), treating the subject from the agricultural point of view, thought that the evidence was best interpreted on the assumption that sour soils were deficient in lime and hence rich in available alumina. Thus, many crop plants like barley, which is sensitive to alumina in small quantities, were unable to grow on sour soils. Dr. W. H. Pearsall had evidence to show that many peat plants could grow in soils or solutions which were not acid, if the proportion of lime was sufficiently low compared with soda and potash. He considered this proportion to be the most important factor for peat plants. Prof. J. H. Priestley described the anatomical evidence from plants, particularly those from peat, and pointed out that the principal feature of these plants was the large quantity of fat they contained. He agreed that the proportion of soda, potash and magnesia to lime was probably a very important factor, as this would control the movements of the fats, and hence determine the structure and absorbing power of the plants.

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British Birds for October contains 'Some Observations on Cuckoos,' by E. Chance; 'Field Notes from Glamorganshire,' by G. C. S. Ingram and H. M. Salmon, and many shorter notes.

'The Falcons of Great Orme's Head,' by T. A. Coward, is the title of an article in the Autumn number of *Bird Notes and News*, where also is to be found a lengthy report on the Wild Birds Protection Bill.

YORKSHIRE NATURALISTS AT BEDALE.

W. H. PEARSALL, D.SC., F.L.S., AND F. A. MASON, F.R.M.S.

THE meeting at Bedale during Bank-holiday week-end (the 309th Excursion of the Union) took a course in striking contrast with previous meetings held higher up the dale, when field work was the principal incentive to attendance. At Bedale, the investigational side was kept rather in the background, although work in the field was not entirely neglected. Mr. F. Croft, of Leyburn, acted as guide throughout the week-end, and his knowledge of the locality proved to be equalled only by his uncanny influence over dales-people in remote places when refreshment was a desideratum.

On Saturday, by the courtesy of Col. Cavaye, a visit was paid to Hornby Castle, a seat of the Duke of Leeds. Here the party, after examining the portion of the castle showing work of the Norman period, was afterwards conducted through the interior. The most interesting feature of this splendid mansion is its collection of pictures. These included family portraits by the great artists, Vandyke, Van der Vart, Kneller and Sir Joshua Reynolds. A striking portrait of Sir Joshua, painted by himself, is one of the masterpieces in this famous collection. Members were also permitted to visit a 'Charles I.' room hung with numerous paintings illustrating the life (and death) of that monarch. A very superficial survey of the flora in the neighbourhood of the castle revealed nothing of a striking nature. Among plants listed by Miss M. Hewlett were *Lotus uliginosus* and *Juncus bufonius*. The gardens contained, among other interesting species, *Fraxinus ornus* and *Spiræa salicifolia*.

Leaving Hornby, the party proceeded by motor to Hauxwell Hall, the residence of Col. Wade-Dalton. Himself a naturalist of long and varied experience, Col. Wade-Dalton devoted the greater part of the morning to showing members an extensive collection of birds, acquired during many years of serious ornithological work in Spain, Gibraltar, Ceylon, and various parts of our Indian Empire. A collection of the butterflies of Ceylon, and many other objects of natural history interest, including 'lucky bones' from the shoulder of a tiger, much prized as a charm by the Indian natives, porcupine quills extracted from the paws of lame leopards, etc., were all shown and interestingly commented upon by Colonel Wade-Dalton. After an alfresco meal, the party again had the pleasure of being conducted by the Colonel through his extensive grounds, where he described his experiments in arboriculture, aimed at beautifying the landscape as well as for the purpose of accumulating evidence as to the suitability, or otherwise, of the soil and climate for maturing numerous exotic species of forest trees. These included, among many interesting species, the following: *Taxodium sempervirens*, *Wellingtonia gigantea*, *Pseudotsuga albertiana*, *P. Douglasii*, the Japanese Larch (*Larix leptolepis*), *Picea pungens*, *Abies nobilis*, *Pinus austriaca*, *P. Cembra*, *Juniperis virginianæ*, *Quercus falcata*, *Q. coccinea* and *Ginkgo biloba*. Fine specimens of the Himalayan Spruce, the Spanish Fir and the Deodar excited a good deal of interest, as did also a miniature nursery of seedlings of many of the above-mentioned trees in various early stages of growth. As Col. Wade-Dalton keeps careful records of the annual growth of his trees, many of which he has watched for 30 years, his experiments must one day yield very valuable information; members were greatly impressed by the results the Colonel had to show them.

The general botanical features of this district, mainly on the Millstone grit, with adjoining Magnesian limestone, was not devoid of interest, and (making use of Miss Hewlett's notes again) the following plants were observed:—

Hypericum quadrangulum.
Ononis repens.
Epilobium hirsutum.
E. angustifolium.
Potentilla reptans.
Sium erectum.
Matricaria Chamomilla.
Tanacetum vulgare.
Hieracium Pilosella.

Campanula latifolia.
Bartsia Odontites.
Ballota nigra.
Deschampsia cæspitosa.
D. flexuosa.
Bromus sterilis.
Melica uniflora.
Cystopteris fragilis.

Monday was set apart for a visit to Burrell and Thornton Watlass at the kind invitation of Sir Matthew Dodsworth. Along with his agent, Mr. C. Clarke, Sir Matthew met the party at Burrell and personally conducted it through his estate, much of which is under afforestation, and an examination of the plantations well repaid the visit. The methodical care with which timber and sporting values had been kept in view suggested happy co-operation between a broad-minded land-owner and an energetic agent possessing a sound knowledge of timber culture; the existence of such well-managed estates are object lessons which cannot fail to influence forestry practice in the country.

The route of inspection covered about a dozen blocks of timber, and apart from ages of trees, showed good examples of the old and new methods of planting. Larch canker was prevalent, but there is promise of an ultimate crop of sound larch wood as a reward for judicious treatment. Much labour has been expended in drainage. In view of the variable nature of the soil, much might be said in favour of the system of leaving results to decide in the case of certain mixed plantations whether hard or soft wood shall form the ultimate crop.

A block that attracted special attention was a mixed wood of Douglas Fir, Scots Pine and Alder planted in 1913. In the early years the young trees were at a standstill, the lower four feet being scrubby, and a good many failures were evidenced by refills. The trees are now well established and making phenomenal growth; an annual increase of four feet in height is shown by many, and despite the early setback, many of the trees were 20-25 feet high. The list of plantations to be visited, so kindly supplied by Mr. Clarke, was very helpful in understanding the work that has been going on during the past thirty years.

Later in the day Sir Matthew invited the members to tea at Thornton Watlass Hall, after which he showed them many beautiful and interesting treasures of his home. These thoughtful and kindly courtesies of Sir Matthew Dodsworth were greatly appreciated, and the thanks of the visitors were sincerely voiced by Dr. Woodhead, before taking leave of Sir Matthew.

Miss Hewlett's botanical notes record an interesting flora of the Burrell stream and ghyll, the following plants being noteworthy :—

Galium palustre var. *Witheringii.*
Stachys palustris.
Apium nodiflorum.
Hottonia palustris.
Sparganium ramosum.
Sium erectum.

Carduus palustris.
Juncus effusus.
J. lamprocarpus.
Carex paniculata.
Equisetum palustre.
Zannichellia palustris.

whilst the pastures yielded :—

Hypericum pulchrum.
Filago germanica.
Geranium pratense.
Bartsia Odontites.

Chlora perfoliata.
Centaureum umbellatum.
Euphrasia officinalis.
Stellaria graminea.

Time was also found to visit Snape Mires, and the castle bearing that name was several times made a rendezvous, though less often reached. The results of these excursions are as follows :—

At a meeting held at Headquarters on Monday evening, reports of the various sections were submitted. Votes of thanks were accorded to the many landowners of the district who had extended hearty welcome to the Union and had expressed an interest in its work. Sympathy with Mr. J. Hartshorn, who had been prevented from attendance by family sickness, was expressed, and a vote of thanks to Mr. Clarke for his services as guide, terminated a meeting that will long be remembered.

GEOLOGY (W. S. Bisat).—A quarry in the Upper ? (flaggy) Magnesian Limestone which is situated on the Masham road near Thornton Watlass was examined. The quarry is large, and exposes about 40 feet of thin flaggy limestones. The usual creamy colour is prevalent, but near the top of the quarry, for a depth of about 12 feet, the limestone is very hard and black, and used for road metal. A hand specimen might easily be mistaken for a black Carboniferous Limestone, and I have never seen anything approaching these beds in colour and texture in the South Yorkshire Upper Magnesian quarries. The marl partings so common in South Yorkshire are here absent. The limestones are feebly fossiliferous, more abundantly so at or near the summit of the quarry. The fauna more resembles that at the base of the Lower Magnesian of South Yorkshire than that of the Upper, including *Fenestella*, *Acanthocladia*, *Productus*, and a large lamellibranch, possibly *Edmondia*.

The solid geology is, however, poorly seen round Bedale, being masked by drift gravels and alluvium. The gravels, as seen in the large pit between Snape and the Bedale-Masham road, are seen to contain a very high percentage of Carboniferous Limestone boulders and pebbles, and a very low percentage of Magnesian Limestone pebbles, with a moderate admixture of sandstone pebbles and boulders. The general absence of coarse grits suggests that these gravels are derived from drift which has come from the Yoredale rather than Millstone grit country. The water percolating through the gravels is highly charged with lime, deposited on the underside of pebbles as limy smears and minute stalactites, and forming tufaceous deposits in the streams.

BRYOLOGY (W. H. Burrell).—The extent of ground covered, mostly enclosed land, and the varied nature of the objects of interest that claimed attention did not favour intensive work. Geological maps show the country lying to the west of Bedale as gritstone, but the roadside moss flora at Hauxwell was not altogether in harmony; there was an intrusion of lime-loving species such as *Anomodon viticulosus* and *Encalypta streptocarpa*, although that typical moss of the limestones—*Hypnum molluscum*—was not seen. Garriston Beck yielded none of the plants indicative of either hard or soft waters, but only those of general distribution which adapt themselves to almost any kind of wet rock, such as *Brachythecium rivulare*, *Eurhynchium rusciforme*, *Amblystegium filicinum*, and *Dichodontium flavescens*; with *Webera carnea*, *Orthotrichum cupulatum* and *Brachythecium cæspitosum* on the banks. Snape Mires, a grown-up alluvial area yielded very few mosses, *Hypnum cuspidatum* and *Funaria hygrometrica* were the most abundant species.

During a later journey through Teesdale a side light was thrown on the occurrence of mosses on what may appear at first sight to be uncongenial soil. In the neighbourhood of Cotherstone, *Encalypta streptocarpa* was luxuriating on a roadside, dry built, gritstone wall. In the absence of mortar joints and limestone boulders there was no visible reason why it should be there, so a large tuft was gathered for further study. The fine sand in which the plant was embedded was found to contain 50% Silica, 40% Lime and Magnesia, 0.5% Iron and Alumina; the largest grains reached 1 mm. diameter, and it seemed probable that this material was wind borne dust from the roads, upon which the plant had developed, and which had continued to accumulate during the growth of the tufts.

A similar modification of the native flora may sometimes be seen on

heathland where limestone or chalk is used for metalling or binding the roads, a bright green strip of pasture dividing the road from the darker coloured heathland beyond.

ZOOLOGY (W. G. Bramley).—August is not, as a rule, a good time for observing birds, but several interesting species were noted. Goldcrests appeared to be fairly common, and a family party was watched feeding not far from the town. They were joined by some Long Tailed Tits and Willow Wrens, while a solitary Marsh Tit was noted at the same time. Jays and Magpies were in evidence; several of the latter, together with Kestrels and Crows, being hung on the fences round the woods at Snape Mires. It was also reported that the Green and Great Spotted Woodpeckers occur, but are shot, since they damage the trees! The only other point of note was the occurrence of a Rook having the lower mandible at least half an inch longer than the upper one.

MOLLUSCA (Greevz Fysher).—The weather during most of the Excursion was warm and dry, which was unfavourable for observing terrestrial Mollusca, but showers fell on one or two occasions which brought some of them out.

The following is a list of the species observed, the gatherings having been submitted to J. W. Taylor, Esq., M.Sc.

BEDALE BECK.

<i>Valvata piscinalis</i> .	<i>Hygromia hispida</i> .
<i>Pisidium pusillum</i> .	<i>Pupa umbilicata</i> ,
<i>P. subtruncatum</i> .	<i>Zua lubrica</i> var. <i>lubricoides</i> .
<i>Pyramidula rotundata</i> .	<i>Hyalinia cellaria</i> .
	<i>H. nitidula</i> .

BEDALE GARDENS.

<i>Helix hortensis</i> (type).	<i>Pyramidula rotundata</i> .
<i>Hygromia striolata</i> and <i>H. hispida</i> .	<i>Pupa umbilicata</i> and various slugs.

BEDALE.

<i>Hygromia striolata</i> .	<i>Hyalinia nitidula</i> .
<i>H. hispida</i> .	<i>Helix hortensis</i> var. <i>libellula</i> and
<i>Xerophila caperata</i> .	var. <i>fasciata</i> .
<i>Pyramidula rotundata</i> .	<i>H. aspersa</i> .

HORNBY

<i>Helix hortensis</i> type and var. <i>considea</i> .
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HAUXWELL.

<i>Limax maximus</i> .	<i>Hyalinia nitidula</i> .
<i>Hygromia striolata</i> .	<i>H. cellaria</i> and var. <i>alba</i> .

AISKEW.

<i>Helix aspersa</i> var. <i>undulata</i> .	<i>Hygromia striolata</i> .
<i>H. hortensis</i> var. <i>libellula</i> ,	<i>H. hispida</i> .
12345 and 00000.	<i>Hyalinia nitidula</i> .

THORPE PERROW LAKE.

<i>Valvata piscinalis</i> .	<i>Planorbis glaber</i> .	<i>P. marginatus</i> .
-----------------------------	---------------------------	------------------------

SNAPE MIRES.

<i>Planorbis marginatus</i> .	<i>Bithynia tentaculata</i> .
<i>P. corneus</i> and <i>P. albus</i> .	<i>Helix hispida</i> .

DIPTERA (Chris. A. Cheetham).—With the exception of swarms of *Hydrotæa irritans*, Diptera were few, Syrphids being generally absent in fields where Ragwort, Knapweed, Betony, etc., made a glorious show of colour. One looks for an explanation, and the first is that early August is usually a quiet time, the year has, however, proved very disappointing generally from an entomological view point.

Butterflies were scarce, odd specimens only were seen of Whites, Meadow Brown, Small Heath, Common Blue, Small Tortoiseshell, Red Admiral and Painted Lady. No dragonflies were caught.

The most showy Diptera were *Chrysonotus bipunctatus*, the large

wasp-like *Sericomyia borealis*, *Syrphus grossulariæ* and *ribesii*, and the drone flies *Eristalis intricarius*, *pertinax* and *tenax*. The destructive daddy longlegs, *Tipula oleracea*, was in plenty, but few other species; *T. nigra* was an interesting addition to the Yorkshire list, and *Prionocera turcica* (*T. diana*) was taken for the second time in the county. Two interesting Tachinids, *Dexia vacua* and *Oliveria lateralis* from Snape Mires, the ground where most of the insects were collected, but no biting flies, either Clegs or Mosquitoes, were caught even on this likely place. Probably the most interesting group was the Dolichopods, the Silvery *Argyras*, *leucocephala* and *argentina*, and a brilliant metallic purple and green *Porphyrops elegantula* far away the most agreeable capture of the excursion. *Liancalus virens*, *Xanthochlorus ornatus*, *Eutarsus aulicus* (the only other record for this is Bubwith), together with others in the list give this family the first place.

Two good additions in the Syrphids are *Orthoneura nobilis* and *Chrysogaster splendens*, the very attenuate *Baccha elongata* was also taken and the narrow *Syrphus compositarum*.

Looking over the list of about a hundred and thirty species, and considering the date and kind of year, the Bedale meeting was a success from the Diptera standpoint.

The following are all additions to Vice-County 65, and those marked with an asterisk have not been previously recorded for the county.

- | | |
|--|---|
| <i>Simulium latipes</i> Mg. | <i>Syrphus grossulariæ</i> Mg. |
| <i>Dixa nebulosa</i> Mg. | <i>S. balteatus</i> Deg. |
| <i>Ptychoptera scutellaris</i> Mg. | <i>Ascia podagrica</i> Fab. |
| <i>Antocha vitripennis</i> Mg. (<i>opalizans</i> O.S.). | <i>A. floralis</i> Mg. |
| * <i>Erioptera flavescens</i> L. | <i>A. geniculata</i> Mg. |
| <i>E. trivialis</i> Mg. | <i>Volucella pellucens</i> L. |
| <i>Symplecta stictica</i> Mg. | <i>Onesia cognata</i> Mg. |
| * <i>Pachyrrhina cornicina</i> L. | <i>Polietes albolineata</i> Fall. |
| <i>P. maculosa</i> Mg. | <i>Phaonia</i> (<i>Hyetodesia</i>) <i>basalis</i> Zett. |
| * <i>Tipula nigra</i> L. | <i>Mydæa</i> (<i>Spilogaster</i>) <i>atripes</i> Mde. |
| * <i>T. pierrei</i> Tonn. This has been recently split off <i>T. lateralis</i> . I have a specimen I took at Bubwith previously. | <i>Hydrotaea similis</i> Mde. |
| <i>Prionocera turcica</i> Fab. (<i>T. diana</i> Mg.). | <i>Anthomyia pluvialis</i> L. |
| <i>Chrysonotus</i> (<i>Sargus</i>) <i>bipunctatus</i> Scop. | * <i>Hydrophoria divisa</i> Mg. |
| <i>Hemerodromia precatória</i> Fall. | <i>H. conica</i> W. |
| <i>Tachydromia Verralli</i> (Collin m.s.) | <i>Fannia</i> (<i>Homalomyia</i>) <i>coracina</i> Lw. |
| <i>Eutarsus aulicus</i> Mg. | <i>Azelia Zetterstedtii</i> Rnd. |
| <i>Dolichopus pennatus</i> Mg. | <i>A. triquetra</i> W. |
| <i>D. griseipennis</i> Stan. | <i>Hoplogaster mollicula</i> Fall. |
| <i>Chrysotus neglectus</i> Wied. | <i>Helomyza olens</i> Mg. (<i>pallida</i> Fall.) |
| * <i>Porphyrops elegantula</i> Mg. | <i>Tetanocera elata</i> Fab. |
| <i>Syntormon pallipes</i> Fab. | <i>Elgiva albiseta</i> Scop. |
| <i>Xiphandrium caliginosum</i> Mg. | <i>Loxocera ichneumonea</i> L. (<i>aristata</i> Pz.). |
| <i>Campsicnemus curvipes</i> Fall. | <i>Acidia cognata</i> W. |
| <i>Verrallia aucta</i> Fall. | <i>Tephritis vespertina</i> Lw. |
| * <i>Orthoneura nobilis</i> Fall. | <i>Lonchæa chorea</i> Fab. |
| * <i>Chrysogaster splendens</i> Mg. Dr. W. J. Fordham writes me that he has taken this species at Filey. | <i>Sapromyza decipiens</i> Lw. (<i>sordida</i> Hal.). |
| <i>Chilosia proxima</i> Zett. | <i>Sepsis violacea</i> Mg. |
| <i>Platychirus clypeatus</i> Mg. | <i>Notiphila riparia</i> Mg. |
| <i>Pyrophæna granditarsa</i> Först. | <i>N. cinerea</i> Fall. |
| | <i>Hydrellia griseola</i> Fall. |
| | <i>Parhydra quadripunctata</i> Mg. |
| | * <i>Cænia palustris</i> Fall. |
| | * <i>Meromyza saltatrix</i> L. |
| | <i>M. læta</i> Mg. |
| | * <i>Cetema</i> (<i>Centor</i>) <i>myopinus</i> Lw. |

PLANT GALLS (W. P. Winter) :—

- HOM. *Chermes abietis* Kalt., *strobilobius* Kalt., *viridis* Ratz., on Spruce. Three very distinct galls were found and they are provisionally recorded here pending full determination of the insects at the appropriate season.
- FUN. *Epichloë typhina* Pers., on *Brachypodium sylvaticum* Roem. and Schult. Three Huddersfield records only for the fungus, but not on this grass.
- AC. *Eriophyes tristriatus* Nalepa var. *erinea*, on *Juglans regia* Linn. Seems new to North of England. Reported for Porlock and Minehead, v. *Entomologist*, August, 1923.
- DIP. *Perrisia marginemtorquens* Winn., on *Salix fragilis* Linn., agg., and on *S. viminalis* Linn.
- HYM. *Pontania proxima* Lepel, on *Salix fragilis* Linn.
- DIP. *Perrisia inchbaldiana*, on *S. alba* Linn. Also Huddersfield and Middlesbrough, B. and H.
- HYM. *Pontania salicis* Christ., on *Salix nigricans*. [Previous records for Yorks., but not on this willow.]
- DIP. *Oligotrophus capreæ* Winn., on *S. caprea* Linn.
- AC. *Eriophyes salicis* Nal., on *S. caprea* Linn.
- AC. *Eriophyes brevitarsus* Focken, *laevis* Nalepa *nalepai* Focken, on Alder.
- HYM. *Biorrhiza pallida* Oliv., *Cynips kollari* Hartig., on Oak. Witches' Broom, on Beech. Beginning of *Hartigiola annulipes* Hg.
- HOM. *Schizoneura ulmi* Linn., on Wych Elm.
- DIP. *Janetiella lemeei* Kieff., on Elm. Reported for Bardsey, near Leeds, B. and H.
- DIP. *Perrisia urticae* Perris., on *Urtica dioica*.
- DIP. *Perrisia persicariae* Linn., on *Polygonum amphibium*.
- DIP. *Ametrodiplosis thalictricola* Rüb., on *Thalictrum flavum*. Reported by Dr. Fordham for Ings by Derwent at Bubwith, v. *Naturalist*, February, 1919, p. 71.
- FUN. *Cystopus candidus* Lév., on Shepherd's Purse.
- DIP. *Perrisia ulmariae* Bremi., on Meadow Sweet.
- HYM. *Rhodites rosæ* Linn., on *Rosa canina*.
- DIP. *Perrisia cratægi* Winn., on Hawthorn.
- AC. *Eriophyes goniothorax* Nalepa, on Hawthorn.
- AC. *Eriophyes macrorrhyncus* Nalepa, on Sycamore.
- HOM. *Psyllopsis fraxini* Linn., on Ash.
- DIP. *Oligotrophus bursarius* Bremi., on Ground Ivy.
- DIP. *Perrisia veronicæ* Vallot, on *Veronica chamædrys*.
- AC. *Eriophyes galii* Karp., on *Galium aparine* Linn.
- HOM. *Aphis viburni* Scop., on *Viburnum opulus*.
- HOM. *Siphocoryne lonicerae* Siebold, on Honeysuckle. No previous Yorkshire record.

—: o :—

An Introduction to Stratigraphy, by L. Dudley Stamp. London : T. Murby & Co., xv.+368 pp., 10/- net. The author of this book gives an introduction to Geology on rather new lines, and after dealing with some Principles of Stratigraphical Geology ; General ; Geological Time ; Orogenic or Tectonic Phenomena ; Ingeous Phenomena ; Phenomena of Climate ; Phenomena of Sedimentation ; Palæontological Phenomena ; Stratigraphical Palæontology ; The Morphology of the British Isles ; he refers to the various Geological Systems from Pre-Cambrian to the Quarternary, and concludes by giving Hints on the Study of Stratigraphy, which are quite good. The volume is well illustrated by maps and diagrams, and will prove of considerable use to the student.

NORTHERN NEWS.

Part XVIII. of Hutchinson's *Animals of All Countries* is largely devoted to the various species of pheasants, pigeons, peacocks and similar birds.

The publications issued by the London Museum continue to be popular, judging from the fact that a fourth edition of its Guide to the Prehistoric Room, and third editions of the Guide to the Roman Room and Guide to the Anglo-Saxon Corridor have recently been issued.

From the Canada Department of Mines, Victoria Memorial Museum, we have received Bulletin No. 37, which consists of 'An Album of Prehistoric Canadian Art,' by Harlan I. Smith (196 pp., 50 cents). It contains clear outline drawings of some hundreds of objects in pottery, stone, bone, as well as rock carvings, and other matters of interest to the archæologist.

We learn from the press that Mr. F. W. Dalby, of Compton, Collingham Bridge, reports a curious incident after a recent heavy thunderstorm. Looking out of his bedroom window he saw on the surface of the lake in his grounds what he took to be a large number of feathers, and he thought some birds had been killed. On closer examination, however, they were found to be dead fish, over 1800 of them, mostly roach, which he imagines had been killed during the storm either by a thunderbolt or lightning. Mr. Dalby wonders whether any reader can supply a scientific explanation of the incident. In *The Field* for August is an article on the effect of thunder upon fish, which may have some bearing upon the incident at Compton.

A young French student, while exploring the underground source of a small tributary of the Garonne, came upon an unexplored cave containing a remarkable collection of clay models of different animals, in addition to a number of rough mural paintings. The importance of the discovery has been testified to by several leading experts of the French museums. An authority at the British Museum said that the find was a really wonderful one. 'It is almost impossible to give anything like an exact date, but probably the works which have been found date from about 40,000 to 20,000 B.C., and would have been executed towards the last stages of the palæolithic period. The only previous models known are those of the male and female bison, which were discovered on Lake Augubert by Comte Henri Begouen.' Personally, we should like a little more information about the discovery before attempting to give a date.

We understand that a pamphlet dealing with the Flint Implements of Cromer has recently been written by an East Anglian Prehistorian, well known for the number of articles he writes, but the publishers have been instructed not to send a copy for notice in *The Naturalist*, as the author takes exception to the way in which his work is referred to in this journal. The publisher is also requested to state that 'under no consideration will any further publication of his be forwarded to *The Naturalist* for review.' This seems most unfortunate, and we shall have to 'bear up!' It is the first instance, however, in which we have heard of an author being unable to bear criticism, as our pages are always open for reply to any criticism made in this journal. We presume that those journals which, in their innocence, or ignorance, continue to flatter, will have copies submitted to them. Oddly enough, this same 'author' criticises a work on prehistoric remains in the October issue of *Science Progress*, the only reason for which, we assume, is that his name does not appear in the Index! Anyway, to prove our sincerity, we shall be glad to place our pages at the disposal of the prehistorian in question, for the purpose of his promised further memoir on the alleged palæolithic model of a mammoth which he described some time ago, but which some of us thought was a quite natural object, namely, a portion of a chalk ammonite. This view was combated by the 'author,' who promised a further memoir on the subject. It has not yet appeared.

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T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,

The Museums, Hull;

AND

T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,

Technical College, Huddersfield,

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

G. T. PORRITT, F.L.S., F.E.S.

JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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- Huddersfield Arch. and Topog. Society. 1st Report, 1865-1866. (38 pp.).
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- Keighley Naturalists' Society Journal. 4to. Part 1.
- Lancs. and Cheshire Antiq. Soc. Vols. IV., V., VIII., XXV).
- Louth Ant. and Nat. Soc. Reports, 1-12, 19.
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NOTES AND COMMENTS.

DR. SMITH WOODWARD'S ADDRESS.

The title of Dr. A. Smith Woodward's Presidential Address to the Yorkshire Naturalists' Union at Barnsley, on Dec. 8th, will be 'The Animals of the Carboniferous Period, with special reference to Discoveries in Yorkshire,' with lantern views. Dr. Smith Woodward's numerous contributions to science are well known, and are of world-wide importance. We possess a copy of a very early magazine called 'The Geological Corresponding Society's Magazine,' which contains an article by him on the Dentition of a Shark. This was printed so long ago as 1883; but even that was not the Doctor's first contribution to scientific literature, as in 1882 he published an article on the Occurrence of Oxide of Manganese in the Yoredale Rocks of East Cheshire, to *The Proceedings of the Manchester Literary and Philosophical Society*. His next was on Evansite (*The Mineralogical Magazine*, 1884). Evidently, the Doctor's early inclinations were towards mineralogy, and we are grateful that Palæontology eventually proved so great a charm for him, to our great advantage.

BRITISH MYCOLOGISTS.

The British Mycological Society has issued its *Transactions*, which contain the following useful contributions:—'Norwich Foray,' 'Keswick Foray,' 'Keswick Lichens,' by H. H. Knight; 'Report on the Mycetoza found at Keswick,' by W. N. Cheesman and W. T. Elliott; 'Presidential Address: Some Present-day Aspects of Mycology,' by F. T. Brooks; '*Lamproderma columbinum* Rost. and its Varieties,' by G. Lister; 'An Alpine form of *Anellaria separata*,' by S. Hastings; 'New British Discomycetes,' by W. D. Buckley; 'Remarks on the Nature and Definition of Species,' by R. C. McLean; 'Ecology and Phenology of Surrey Mycetoza,' by P. J. Alexander; 'British Laboulbeniaceæ: a Catalogue of the British Specimens in the Thaxter Collection at the British Museum,' by Winifrede L. Hake; 'The Fungus present in *Lunularia cruciata* (L.) Dum., by W. F. F. Ridlet; 'The genus *Trichosterigma* Petch,' by T. Petch; 'Spore Formation in *Rhacodium Cellare* Pers.,' by J. H. V. Charles; 'A List of Fungi, etc., maintained in the National Collection of Type Cultures,' by R. St. John Brooks and Mabel Rhodes; 'On *Dematium pullulans* de Bary, by Isme A. Hoggan; 'Studies in Entomogenous Fungi,' by T. Petch. One of the editors, Mr. Carleton Rea, gives a paper on 'Edible Chestnuts—we mean Edible Fungi,' which is somewhat amusing.

THE BIOLOGY OF BIRDS.*

This volume is in uniformity with 'Biology of the Sea-

* By J. Arthur Thomson. London: Sidgwick & Jackson, xi. + 436 pp., 16/- net.

shore ' and other works on the Biology of Insects, and of Flowering Plants, the last two being in preparation ; and the publishers have been fortunate in getting such an able exponent as Professor J. A. Thomson. In this particular series the questions of adaptation, struggle, sex, heredity, variation, selection and behaviour are treated, which makes the study of birds altogether more instructive than is possible



Nestlings of the Great Skua.

by the perusal of the usual type of monograph or bird list. One of the illustrations we are kindly permitted to give herewith.

ANCIENT MAN IN BRITAIN.*

Still another fat† volume has been added to the stream of books dealing with Early Man. 'As a substitute for the Archæological Ages, the writer suggests in this volume a new system, based on habits of life, which may be found useful for historical purposes. In this system the terms "Palæolithic," "Neolithic," etc., are confined to industries. "Neolithic Man," "Bronze Age Man," "Iron Age Man," and other terms of like character may be favoured by some archæologists, but they mean little or nothing to most anatomists, who detect different racial types in a single "Age." A history of

* By Donald A. Mackenzie. London : Blackie & Son, xv.+257 pp. 12/6 net.

† Owing to the exceptional thickness of the paper, the volume, which contains considerably fewer pages than a volume of *The Naturalist*, is two inches in thickness.

ancient man cannot ignore one set of scientists to pleasure another. Several chapters are devoted to the religious beliefs and customs of our ancestors, and it is shown that there is available for study in this connection a mass of evidence which the archæological agnostics are too prone to ignore. The problem of megalithic monuments must evidently be reconsidered in the light of the fuller anthropological data now available.'

' BLACK-PUDDINGS.'

A sample of the author's style is given in the following paragraph :—'The Continental trade routes up the Danube and Rhone valleys leading towards Britain were for some centuries under the control of the Celts. It was no doubt to obtain a control over trade that they entered Britain and Ireland. On the Continent they engaged in pork curing, and supplied Rome and, indeed, the whole of Italy with smoked and salted bacon. Dr. Sullivan tells that among the ancient Irish the general name for bacon was *tini*. Smoke-cured hams and flitches were called *tineiccas*, which "is almost identical in form with the Gallo-Roman word *taniaccae* or *tanacæ*, used by Varro for hams imported from Transalpine Gaul into Rome and other parts of Italy." Puddings prepared from the blood of pigs—now known as "black puddings"—were, we learn from Varro, likewise exported from Gaul to Italy. The ancient Irish were partial to "black puddings." It would appear, therefore, that the so-called dreamy Celt was a greasy pork merchant.'

MEGALITHIC MONUMENTS.

The Publishers kindly enable us to reproduce the accompanying map, respecting which the author states, 'Mr. W. J. Perry, of Manchester University, who has devoted special attention to the study of the distribution of megalithic monuments, has been drawing attention to the interesting association of these monuments with geological formations. In the Avebury district, stone circles, dolmens, chambered barrows, long barrows, and Neolithic settlements are numerous; another group of megalithic monuments occurs in Oxford, on the margin of the lias formation, and at the south end of the great iron field extending as far as the Cleveland. According to the memoir of the geological survey, there are traces of ancient surface iron-workings in the Middle Lias formation of Oxfordshire, where red and brown hæmatite were found. Mr. Perry notes that there are megalithic monuments in the vicinity of all these surface workings, as at Fawler, Adderbury, Hook Norton, Woodstock, Steeple Aston, and Hanbury. Apparently the Neolithic peoples were attracted to the lias formation because it contains hæmatite,

ochre, shale, etc. There are significant megaliths in the



Whitby region, where the jet is so plentiful. Amber was obtained from the east coast of England and from the Baltic.'

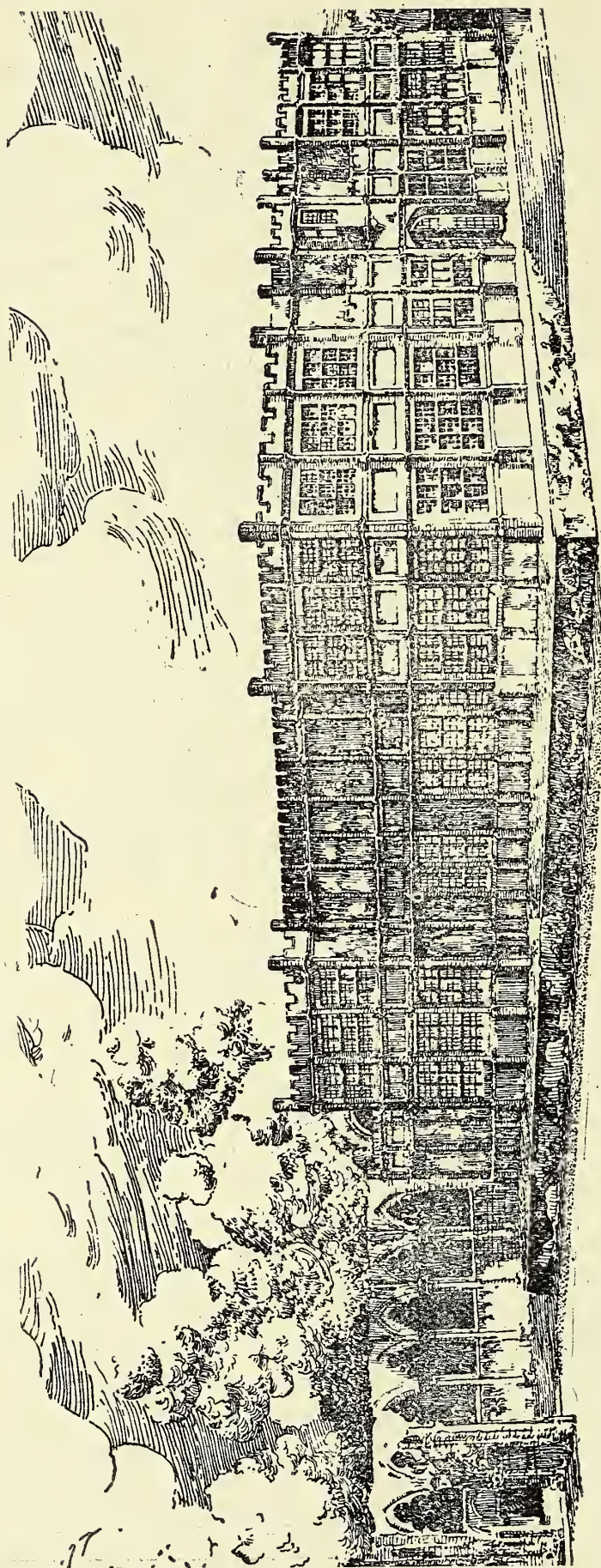
DIATOM PERIODICITY.

Under the able editorship of Professor A. G. Tansley, *The Journal of Ecology* for September is a substantial volume, from all points of view. Three of the articles are of particular interest to our readers, namely :—‘ Dispersal of Pond Floras,’ by H. Godwin ; ‘ A Theory of Diatom Periodicity,’ by W. H. Pearsall ; and ‘ The Phytoplankton of Bodies of Fresh Water, and the Factors Determining its Occurrence and Composition,’ by B. Millard Griffiths. In connection with Dr. Pearsall’s paper, after carefully reviewing the subject, he states that the evidence is clearly consistent with the view that diatom periodicity is largely conditioned by floods, which affect the algæ through their effects on the substances dissolved in the water, particularly in respect to nitrates, silica and oxygen. This hypothesis covers the facts observed in the English Lakes with great precision, but its remarkable aspect seems to lie in the extraordinary wide range of data of which it offers some casual explanation. The choice of examples was conditioned chiefly by the possibility of obtaining fairly reliable data as to flood or other variations in the water. For this reason the European records have been somewhat neglected, as it has been found difficult to obtain the requisite information as to flood or water conditions in precise form. Of all the very numerous cases considered, that of the San Joaquin River offers the greatest divergence from the theory, and it has therefore been included, although its exact interpretation is perhaps open to doubt.

YORK MUSEUM.*

By the courtesy of *The Yorkshire Herald*, we are permitted to reproduce a portion of a very fine illustration appearing in that journal for October 11th, which is entitled ‘ Dr. Collinge’s Proposal for a new museum in the grounds of St. Mary’s Abbey, at York. The suggestion is to pull down the present Musum, which has become too small for its purpose, and erect on the site this magnificent building, which is in perfect accord with the surrounding architecture.’ Unfortunately the block was too large for our pages, but we are able to show the essential part, the building apparently occupying almost all the space between the Multangular Tower and St. Mary’s Abbey. Should this suggestion ever be carried out, the building will doubtless be worthy of the Society, and although at first glance it would seem that the question of cross-lights was going to be a difficulty, this matter has no doubt received the consideration of Dr. Collinge. The cost of the proposed building does not appear to be stated in Dr.

* We quote the name as given in *The Yorkshire Herald*.



Dr. Collinge's suggestion for a new Museum in the grounds of the Yorkshire Philosophical Society, at York.

Collinge's appeal, but we fear the amount will far exceed that subscribed, and that many of us will still see the present by no means unattractive building, for many years to come.

MAGLEMOSE AGAIN.

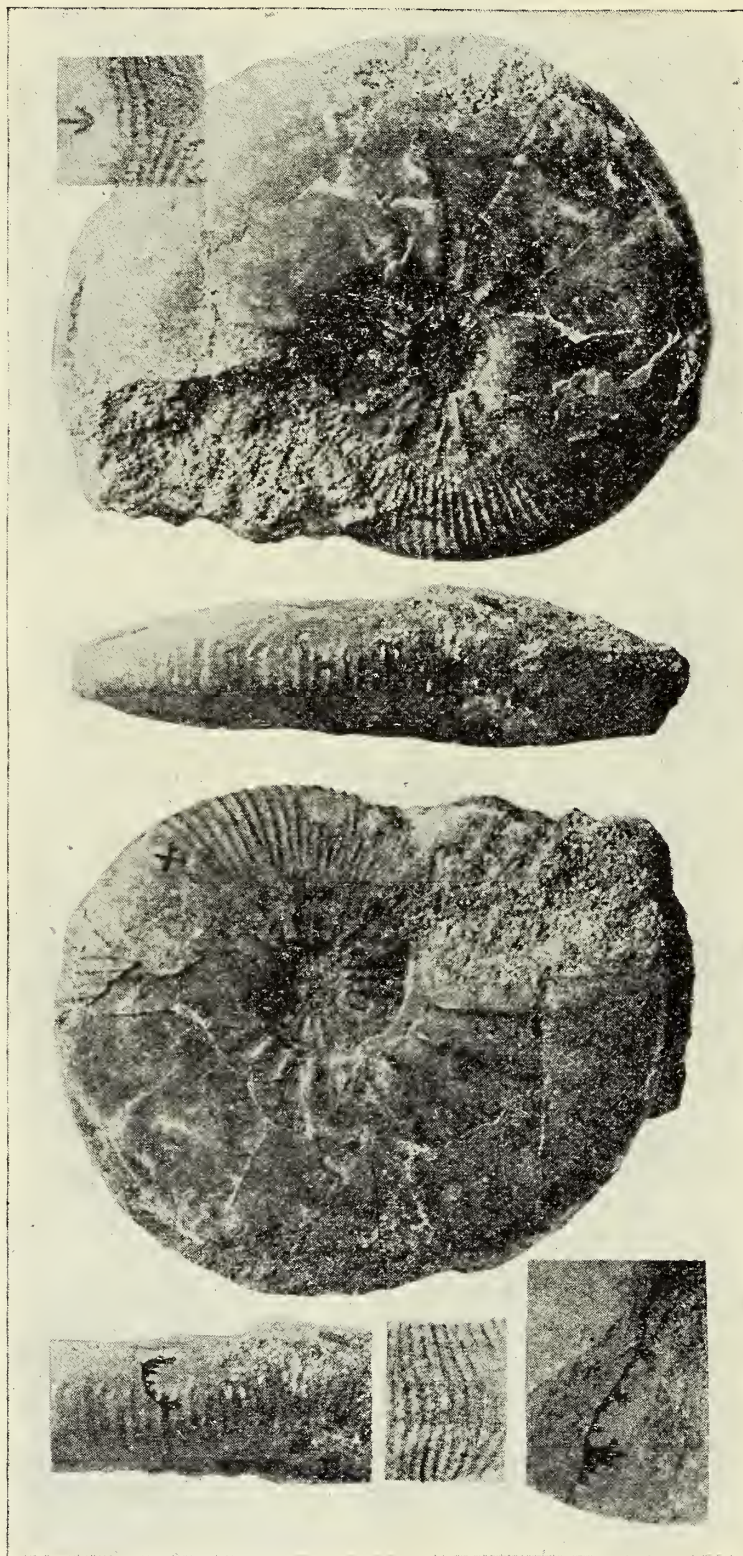
The question of Maglemose Harpoons in Holderness, after having been in abeyance for some time, has again been raised by Mr. Armstrong, who considers that he has had further discoveries to support the original contention he made as to the age of the harpoons. To this Mr. T. Sheppard contributed the following reply in *Man* for October:—‘Referring to the further note on the alleged Maglemose Remains in Holderness, described by Mr. Armstrong in *Man*, for September, it must be regretted that Mr. Armstrong was unsuccessful in finding a harpoon during his researches in the peat deposits. His reference to myself, however, seems to be in the form of a grievance which I should like to have removed. I made the statement quoted in *The Naturalist* during the discussion at the British Association meeting last year, and I was backed up at the meeting by no less an authority than Mr. O. G. S. Crawford, and now that we have an illustration and particulars of the discovery of the alleged Maglemose axe, or adze, or “herminette,” (call it what you will), I most emphatically reiterate everything I stated a year ago.’

MULLERUP AND SVAERDBORG.

‘We are now told that it was found “some years ago after a fall of cliff containing large sections of mere deposits, amongst which the axe was lying.” An important omission occurs here, however, namely, the name of the finder, which, if the axe is as important as Mr. Armstrong makes out, is surely a piece of information which might have been given to us. It has been admitted that it occurred among material which had fallen down from the cliff, therefore its precise relative position is unknown. Surely, in view of the extraordinary details which were given to us as to the precise position and depth of the alleged harpoons from Skipsea and Hornsea, anyone would be justified in stating that this particular axe had nothing to do with the Maglemose harpoons. Furthermore, we have in the Mortimer collection from various parts of the Yorkshire Wolds, flint implements quite as much “of the Maglemose type” as that figured by Mr. Armstrong. We get no peat beds on the Wolds, and, so far as I know, no evidence of Maglemose culture; so that to drag this particular specimen in, with references to Mullerup and Svaerdborg, seems rather like straining, when comparisons might have been made with specimens from our own county.’

KELLAWAYS AMMONITES.

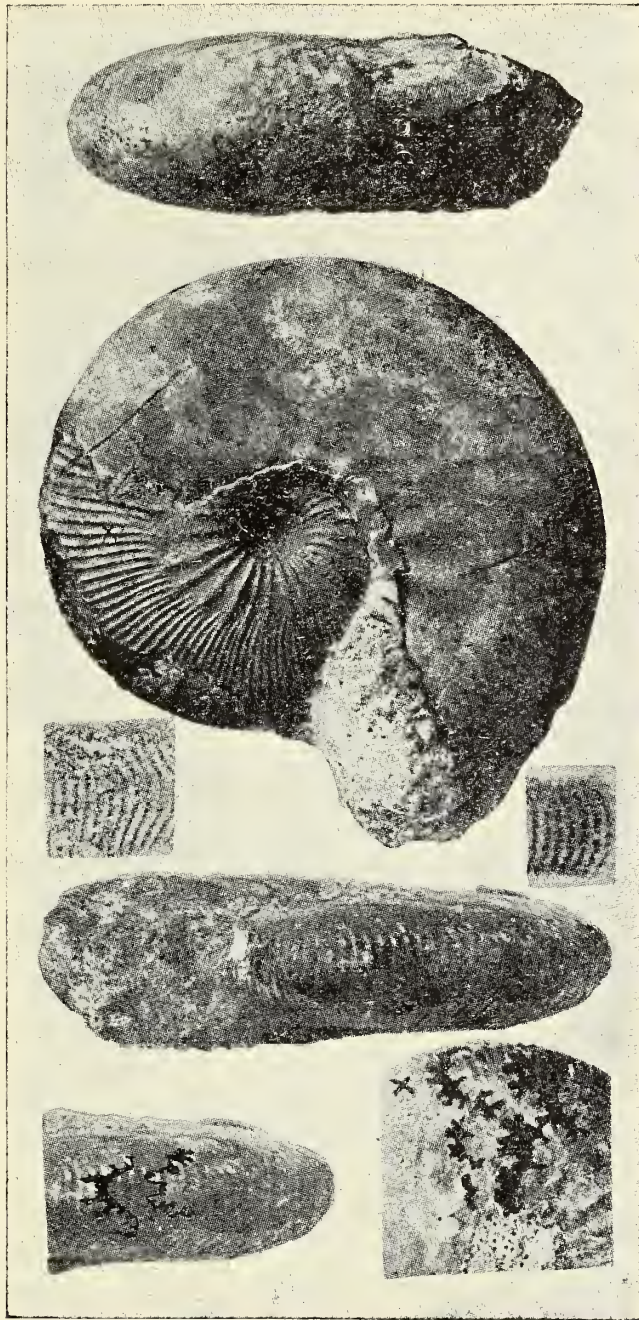
Buckman's 'Type Ammonites' continues to appear with



Catasigaloceras crispatum nov.

almost unexpected punctuality. Part XLII., commencing Volume V., contains twenty plates, among which are the

following Yorkshire specimens:—*Catasigaloceras crispatum* nov. and *C. curvicerclus* nov., both from the Kellaways at South Cave; *Lobokosmokeras rowlstonense*, from the Calcareous



C. curvicerclus nov.

Sandstone of Rowlston Scar, and *Aspidoceras acuticostatum* (two plates) from the Grey Limestone, Yorkshire. We recently (October, page 322) gave illustrations of *A. gulielmi* from the Kellaways of South Cave; and the two illustrations we are also kindly permitted to reproduce herewith will assist in determining these puzzling species.

THORBURN'S PICTURES.

Messrs. Longmans, Green & Co., continue to delight naturalists who have an artistic eye (and what naturalist has not?), by the publication of the remarkably beautiful drawings by A. Thorburn. The firm has recently published thirty coloured plates, upon which about double that number of species of birds is represented, each species being described in detail, with particulars of the colouring adopted by both sexes in different seasons. Not only are the birds shown in various attitudes of rest and flight, but, by the insertion of suitable backgrounds, Mr. Thorburn has produced a series of pictures well worthy of being framed. It is difficult to say which one can admire most, the partridges in a stubble field, ptarmigan among the wild Scottish hills, the geese on the flats of the estuary, the ducks in the pond with the yellow iris, and the kingfisher, etc., in the background, or the scoters on the waves.

LEEDS GEOLOGISTS.

What is described as the Jubilee Volume, Part XIX., of *The Transactions of the Leeds Geological Association*, has just been published (60 pp., 5/-), under the editorship of Mr. J. H. Everett. It contains reports of the meetings and excursions of the Association between 1920 and 1923, together with a valuable series of memoirs prepared by the members, many of which are illustrated by sections, plans, photographs, etc. We wish space would allow us to give summaries of some of the excellent papers, but we can do little more than give the titles, though they indicate the lines upon which the members are working. The publication begins with 'Fifty Years: a Retrospect,' and then follow 'The Rotherham Red Rock,' by R. N. Carruthers; 'The Estuarine Series of the Yorkshire Coast,' by E. Hepworth; 'Recent Notes on the Dogger Sandstone of the Yorkshire Coast,' by L. H. Tonks; 'Notes on the Stratigraphy of the Chalk in Yorkshire,' by H. C. Versey; 'A Boring for Water at Saltaire,' by H. C. Versey and A. Raistrick; and '*Gastrioceras cancellatum* (sp. nov.) at Meanwood, Leeds,' by W. S. Bisat. There is also a 'Classified Index to Vols. 15-19, 1906-1923,' issued with this part of the Transactions. Previously the Transactions of the Society have been described as 'Parts,' and this one on the cover is 'Part XIX.,' though in some sections of the publication, as in the Classified Index, the word 'volume' is used. Which is it? As one interested in the work of the bibliographer, may we ask the editor kindly to omit unnecessary words in titles—such as 'Note on,' as 'Recent Notes on,' etc. The matter is perhaps trifling, but these titles to papers have to be copied over and over again.

METALLIFEROUS DEPOSITS.*

The Editor of *The Geological Magazine* has found time to prepare a substantial volume, which, from his familiar acquaintance with the subject, will probably long take its place as *the* text-book on the subject with which he deals. He himself states that his 'chief objects have been two-fold; first, to give a clear account, founded on basal theories of petrology and mineralogy, of the general principles that underlie the formation of ore-deposits and the changes that they subsequently undergo; secondly, to describe and illustrate a certain number of typical examples of mineral deposits, selected so far as possible to bring out the geological relations of the methods of occurrence of each particular metal,' which gives a good idea of the scope of the work. His first part, dealing with General Principles, is devoted to The Igneous Rocks; Sedimentary and Metamorphic Rocks; The Relations of Water to Ore-formation; Forms of Ore-deposits; Composition and Characters of Ore-deposits; Classification; The Relation of Ore-deposits to External Influences; Metallogenesis; Metallogenetic Zones; and Mineral Formation; whereas the second part is Descriptive, and refers to Copper; Tin; Lead and Zinc; Iron; Nickel; Cobalt, Manganese, Chromium; Mercury, Antimony, Arsenic, Bismuth; The Minor Metals; Aluminium; and The Precious Metals.

FRODINGHAM IRONSTONE.

While, of course, the British Isles receive their proper attention, most of the information in the volume relates to other parts of the world. Respecting the Frodingham Ironstone, the author states, 'Ironstone is worked in the Lower Lias only in the north of Lincolnshire, along a strip of country stretching north and south for some 7 miles through Frodingham and Scunthorpe. The strike of the rocks is here north and south, with a very gentle dip, less than one degree to the east, so that the outcrop is wide and the cover thin for a long distance. When undenuded the full thickness of workable stone is from 25 to 30 feet: it may be described as a ferruginous oolitic limestone: in the upper layers the iron is present as hydrated oxide, but in depth, when quite unweathered, it is found to be carbonate. The effect of weathering is to oxidize the iron and dissolve out the carbonate, hence the oxidized ore at the surface is richer in iron and silica than the carbonate ore of the deeper layers. However, oxidation is somewhat sporadic, and weathered patches are found here and there at a considerable depth. The amount of lime shows a good deal of local variation, and certain

* 'The Geology of the Metalliferous Deposits, by R. H. Rastall.' London: Cambridge University Press. xii.+508 pp., 21/- net.

beds full of large shells (*Cardinia*) are very calcareous. In the unweathered portion a good deal of green silicate is found. Where unaltered the ore is markedly oolitic, and the microscopic structure has been figured by Teall. When oxidized, however, the structure is often completely destroyed, and the stone takes on a peculiar purple-brown tinge. Where all the carbonate has been removed it is soft and incoherent.'

DIVIDING AN ATOM.

Some time ago Professor Dixon designed two banners, which were painted by Messrs. Nash & Co., of Bournemouth,



for use in connection with the famous Red Lion Club, in which he took so keen an interest, and it was pleasant to find him arrayed in the regalia of the King Lion during the latter part of the Feast of Bones, at the Liverpool meeting of the British Association. Professor Dixon's first banners were for Schuster of Manchester, 1915, entitled 'Il Penseroso'; the second one for Parsons, Bournemouth, 1919, showing Sir Charles A. Parsons in more jovial mood ('L'Allegro') at the conclusion of the war. The series was brought up to date for the Hull Meeting by the present writer, whose ideas were again admirably carried out by Messrs. Nash. The banners in this case were Herdman, Cardiff, 1920 (based on the Cardiff poster);

Thorpe, Edinburgh, 1921 (bearing upon the fact that the President was ill during the Edinburgh meeting) ; and Sherrington, Hull, 1922, Sir Charles being represented as the skipper of the ship 'Hull.' The 'Jackal' has now continued the series, and the banner for Liverpool has reference to Sir Ernest Rutherford's Address on 'The Electrical Structure of Matter.' These banners, which it is hoped will become an annual institution, are for the benefit of the Red Lions only, but as they indicate a lighter side of the British Association, and are of some scientific value, we take the liberty of reproducing one, leaving the 'Jackal' to find out how the illustration was obtained ! We hope his teeth are not too sharp !

LINNAEUS.*

We know of no one more qualified to prepare this magnificent volume than the Secretary of the Linnean Society, who has access to unrivalled material for its preparation, and whose enthusiasm for anything connected with the great naturalist is well known. In the sixteen chapters in this work, an account of the childhood, journeyings, teachings, and studies of Linnaeus are given, together with appendices dealing with Linne's Autobiographies ; Genealogical Tables ; Pupils ; Extracts from his '*Nemesis Divina*' ; Swedish Titles, Money and Distances ; Sketch of Swedish History during Linne's Lifetime. There is a fine series of illustrations, and in addition to Dr. Jackson's pleasant style, which makes the volume a pleasure to peruse, the printers and publishers have done their share remarkably well. Every naturalist should read this book.

ANOTHER GENEROUS GIFT.

Following the excellent example set by Mr. W. N. Cheesman, J.P., of Selby, as recorded in this journal for October (p. 321), Mr. H. B. Booth, F.Z.S., M.B.O.U., a Past-President of the Yorkshire Naturalists' Union, is handing to the Union one hundred pounds of his 3½ per cent. Conversion Loan, to assist with the necessary printing in the administration of the Yorkshire Naturalists' Union, and in order to get into closer touch with its various sections and committees. He also expresses a wish that this may help towards the publication of the work of the Vertebrate Zoology Section.

—:o:—

The Chester Society of Natural Science, Literature and Art has issued its *Fifty-second Annual Report and Proceedings*, which contain reports on the work of the various branches and sections. The President this year is Dr. W. Henry Dobie, and the report is issued from the Grosvenor Museum, Chester. We notice that £144 has been subscribed to the Bishop Mercer Memorial Library Fund.

* 'Linnaeus,' by Dr. Benjamin D. Jackson. London : H. F. & G. Witherby, xv.+416 pp., 25/- net.

GEOLOGY AT THE BRITISH ASSOCIATION.

C. P. CHATWIN.

UNDER the presidency of Dr. Gertrude L. Elles, Section C met this year at the University of Liverpool. There was a wide and varied programme, and the proceedings were inspired with enthusiasm, for the sectional meetings were well attended, the papers appreciated, and there was a waiting list for the excursions.

Naturally the outstanding feature of the sectional meeting was the Presidential Address, the subject of which was 'Evolutional Palæontology in relation to the Lower Palæozoic Rocks.' Dr. Elles referred to the advance that had been made in geological classification since the application of genetic principles. It is obvious that if a system of classification is not natural its use is limited, for it would tend to bring together things not closely related; indeed, it would be true to say that a system of classification gauges fairly accurately our knowledge of a subject. In palæontology, if a system of classification is to be natural, it must be based on origin and descent, and its application will demand careful search for undoubted lines of evolution. External resemblance will count for little unless it satisfies the searching test of phylogeny. The President remarked that the older type of work was too dead; the palæontologist of the future must regard organisms as having been once alive, as having ancestors and descendants, as having been what they were through the interaction of forces proceeding from within with those acting from without.

Some of the problems of classification being involved in correlation, it is necessary to take into account the relative values of the faunal changes in shallower and deeper waters respectively. Such factors as temperature, salinity, clearness of water, and the nature of the sea bottom are liable to affect shallow-water faunas to a certain extent. The varying of these factors tends to give rise to different aspects in contemporaneous shallow-water faunas, and hence a certain amount of lateral variation is to be expected. Lateral variation is less recognized and understood by geologists than is vertical variation, showing changes of shallow-water faunas of successive ages. In comparing contemporaneous shallow-water deposits, general rather than particular resemblances are to be looked for. But difficulties in correlation brought about by varying factors may be obviated in two ways; by reference to the evolutionary stages reached in the fauna, or (when possible) by determining the relation of each fauna to its deeper-water equivalent. And, in connexion with the

latter, it is obvious that deeper-water faunas must provide the standard for classification, since the physical conditions associated with them are more uniform and the changes that take place are of greater significance.

As illustrating the application of evolutionary principles to the deeper-water faunas of the Lower Palæozoic, the President drew special attention to the Graptolitoidea, and discussed the three main lines along which these organisms had evolved ; first, the change in direction of growth ; secondly, simplification of branching, and thirdly, elaboration of cell type. Evolutionary trends in Trilobites, Corals, and Brachiopods (as characterizing shallow-water deposits) were then considered. In the case of the Trilobites, Dr. Elles showed how in the evolution of a species-group of *Calymene*, the number of glabella lobes appeared to increase steadily from older to newer beds, so that Silurian forms had generally more lobes than those of Ordovician age. The field-worker, then, without proceeding to specific determination of these Trilobites, would find a useful clue to the age of the beds by observing the stage of evolution attained by the glabella lobes. Another instructive illustration was provided by the evolution of the pygidium in the species-group of *Encrinurus punctatus*. In this instance indication of horizon is afforded by the proportionate relation between the number of segments of the axis with those of the lateral lobes.

In regard to evolutionary trends among Corals, much good work has already been accomplished. But in the case of the Brachiopods, although various forms show certain differences at different horizons, a vast amount of work remains to be done. Much of this must be in the field, and, as Dr. Elles remarked, when field-palæontology has such definite aims in view it becomes a fascinating and absorbing study.

Turning now to the ordinary business of the Section, we have, in accordance with custom, to deal first with papers of a local character. A lecture by Prof. Boswell on the 'Geology of the Liverpool District' formed an admirable introduction to these. Then followed a Discussion on the 'Geography of the Liverpool District from Pre-Glacial Times to the Present,' opened by Sir Aubrey Strahan. The brief notice in *The Naturalist* for October (p. 324) dealt with the history of this district to the end of Glacial times. The changes which have taken place in Post-Glacial times are of a different character, and are due to a different cause. The evidence of buried land-surfaces points to a higher level of the land in Post-Glacial times than now. Sinking of the land and submergence of the low-lying, forest-grown coastal tracks were the first stages in the development of the estuaries as now seen. The problem of the preference by early settlers for the estuary of the Dee

and the apparent neglect of the Mersey, has given rise to much speculation. It seems likely that the land-surfaces which were not submerged until the close of Neolithic time still extended so widely in the estuary and on the adjacent coasts as to create difficulties in navigation.

The more recent geological changes on the northern shore of the Mersey Estuary formed the subject of a paper by Mr. C. B. Travis, who described the four miles of coast between Waterloo and Hightown. The extent of marine erosion during the last few years, consequent upon the changes in the River Alt, was fully realized by those who attended the excursion to Hall Road and Crosby Shore, and saw for themselves the rapid destruction of quite modern houses. Mr. T. A. Jones was on firmer ground when he dealt with the Middle Bunter Sandstones and their Pebbles ; this series of hard, massive beds attaining a thickness of 1200 feet under the City of Liverpool. Fossils are almost absent from the Trias of this district, only a few from the Ordovician quartzites being commented on ; but the petrology was discussed in detail. Two further papers came from the Liverpool school. Prof. Boswell gave an account of the work done on the structure and succession of the Silurian rocks in the Eastern part of the Denbighshire Moors, where a large part of the area is occupied by graptolite-bearing beds of Ludlow age. The sequence closely resembles that in the Llangollen district. The Zone of *Monograptus tumescens* is developed in the area described, and lies above beds of the Nant y bache type. On account of a large amount of faulting the country is broken into blocks, and the thickness of the beds is thus difficult to estimate. Miss M. Workman, a graduate of the Liverpool school, presented the results of her studies on the Permian rocks of Skillaw Clough. As one would expect, her work on the mineral analysis of these rocks was very thorough ; among the points of interest was the first record of hypersthene among the heavy minerals of this system.

As the author of the Survey Memoir (Special Report) on Rock-Salt, Dr. R. L. Sherlock made an authoritative contribution on 'British Rock-Salt Deposits,' a subject particularly appropriate, since in Britain they are restricted to the New Red Rocks. The important subject of the relation of the Permian to the Trias was raised also in the discussion.

In the well illustrated paper on the 'Tectonics of the Lancashire Coalfield,' Prof. G. Hickling managed to marshal a mass of details. In this coalfield faulting is on a larger scale than in any other British coalfield, and from an economic point of view a study of fault-systems is most essential. The form of the coal-basin indicates a large area of buried measures

in which the coal should be at a workable depth, but the determining factor in development will be the thickness of the cover, not the depth of the coal-basin.

Prof. P. F. Kendall read a paper on 'Quaternary Isostatic Readjustments in North-Western Europe,' details of which have already been given in *The Naturalist* (October, p. 327). In addition, Prof. Kendall read a paper on the 'Formation of Lake Deltas.'

Glacialists thoroughly enjoyed Mr. G. Slater's description of the Nordenskiöld and neighbouring glaciers in Spitsbergen. Having already made a prolonged study of the effects of glacial action in East Anglia, Mr. Slater had the good fortune to accompany the Oxford University Expedition to Spitsbergen in 1921, and brought back with him some fine photographs (which were much appreciated on the lantern-screen) and a store of observations. He described the Nordenskiöld and Ebba glaciers, which are fed from the same gathering ground. The Ebba glacier is especially interesting in the upper 'neck' where the ice is nipped in by a ridge of Palæozoic rocks, over which it passes, and subsequently fans out as a dome-shaped glacier with radiating crevasses. It was interesting to see how the section at the neck (showing bands of crevassed and contorted ice filled with englacial material) compared closely with Prof. Sollas's model of ice-action.

Some variety was afforded by Mr. K. W. Earle, who turned attention to the Windward and Leeward Islands, on the geology of which he presented a preliminary report. With the exception of the Virgin Islands on the extreme north, these islands are composed entirely of Tertiary and Recent rocks—andesites, sedimentary tuffs, limestones, and occasional basaltic lava-flows. Mr. Earle's studies have enabled him to conclude that these islands can be recognized as the denuded cones of submarine volcanoes operating from the earliest Tertiary times. The old Continental theory of the origin of the Lesser Antilles must therefore be abandoned.

The ordinary papers finished with a communication from Mr. C. P. Chatwin, who gave a brief account of a series of Gastropods that were collected from the Chalk of Norwich by Dr. A. W. Rowe. Altogether over 60 species new to this country were recognized; some were characteristic of the Maestricht Chalk fauna, others were represented in the Chalk of Aix-la-Chapelle; while some forms were undescribed. An interesting feature was that nearly all these Gastropods were found inside large sea-urchins (*Echinocorys*), to the protective influences of which their preservation was due. Mr. Chatwin regarded these forms as evidence of local shallow-water conditions in *Mucronata* times, and thought that their presence inside the shells of sea-urchins (the Gastropods being in many

cases larger than the apertures of the urchin) indicated slowness of deposition. On the whole the fauna supported Ravn's conclusion that *Mucronata* time in England was a period of uplift.

The sectional meetings concluded with a discussion on Metamorphism. Dr. J. S. Flett opened the discussion, giving an outline of the problems and commenting on the difficulties met with; especially on the experimental side of investigation. In the subsequent discussion, Dr. E. Greenly compared metamorphic action in the North of Scotland with that in Anglesey; in the latter region metamorphism fitted in with the tectonic sequence. Prof. Grenville Cole sent a written communication on the gneissose rocks, expressing the view that the action of metamorphism was probably not more intense in Pre-Cambrian times than in later periods.

From the practical point of view, Mr. Cosmo Johns saw no difficulty in carrying out experimental work at temperatures below 600° and pressure below 10 atmospheres. He thought that changes of profound character might take place under the influence of unilateral pressure. Dr. J. W. Evans thought that experiments would be possible at temperature higher than indicated by Mr. Cosmo Johns. Dr. C. E. Tilley showed how the association of various minerals indicated the grade of metamorphism.

EXCURSIONS.—A good range of subjects was provided by the afternoon excursions. Recent geological changes in the area were seen on the coast, during the excursion to Hall Road and Crosby Shore, already mentioned. The famous quarries at Storeton were, of course, the scene of a visit. Saturday (September 15th) was devoted to a full-day excursion to the neighbourhood of Lake Vernwy, where several exposures in Valentian, Ashgillian, and Caradocian beds were seen. Sunday provided an opportunity for another full-day excursion, to Flintshire, where the Holywell Shales, Carboniferous Limestones and Cherts, and Glacial deposits were examined. Trias and Permian exposures at Scarth Hill and Skillaw Clough, and the Millstone Grit quarries at Parbold were visited on the following Monday afternoon. The last of the excursions was to Lea Green, where the collieries and brick pits were seen, and opportunities were provided for members to descend into the workings.

It must be remarked that, so smoothly did all the arrangements run, both for excursions and sectional meetings, that one was liable to overlook the credit due to the Recorder (Dr. Dwerryhouse), the Local Secretary (Mr. W. Hewitt), and to Mr. I. S. Double (of the University staff—a very able lieutenant), who carried out their duties with that efficiency which is always unobtrusive.

BIRD NOTES FROM WHITBY.

F. SNOWDON.

THAT interesting visitant, the Purple Sandpiper, which comes to us with great regularity, arriving late in October or early in November, turned up in unusually large numbers last winter. Forty or more were sometimes to be seen on the ledges of the East Pier, Whitby, to which they resort daily during their stay here, and where they appear to pick up much food amongst the sea-weed attached to the sides of the pier. Last spring they remained with us considerably later than usual, a remnant of the flock being observed on May 18th.

Although it is very probable that the Lesser Black-backed Gull has bred in the cliffs near Kettleness since the late T. H. Nelson had the birds under observation in the summer of 1903, so far as I am aware no reliable information has been obtained in recent years of its having done so. Mr. A. S. Frank and I have given considerable attention to the matter for several years, and we have repeatedly observed adult birds at the cliff during the nesting season, but until this summer we have failed to obtain definite evidence of the birds having nested. Late this season we had the satisfaction of seeing a bird sitting on a nest, and later we found it in the cliff with two young. At various times during our visits to the cliffs we saw several adult birds, the behaviour of which suggested that they had nests near the one we located, but we were unable to verify this.

A White Wagtail was observed on May 23rd near the East Cliff.

In May a pair of Merlins nested in an unusual situation on the Newton House moor, a few miles from Whitby. The birds took possession of the deserted nest of a Carrion Crow, and five eggs were laid. The nest was about twenty-five feet from the ground in a Scots fir tree standing detached on the moor. Unfortunately both eggs and birds came to grief.

I am pleased to be able to record the occurrence here of the Little Gull, which only visits us at very rare intervals. An immature bird was seen about the outer harbour on July 30th by Mr. Frank, who drew my attention to it. Later, both Mr. J. H. Wilson and I had the pleasure of observing it. On August 16th and 17th, Mr. Frank had another immature bird under observation near the Pier extensions. This bird was further advanced towards maturity than the one previously seen.

The Fulmar was first observed as a summer visitant to Whitby by Mr. Frank in the spring of 1922, when odd birds were seen. During the past season it has come in much

increased numbers. On April 15th the first bird was observed, and as the season advanced we judged there were from twenty to thirty about the cliffs. Early in June several were observed in the cliff some distance down the coast under conditions which suggested that they were breeding or would do so. They were always to be seen about the same place in the cliff until the middle of July, after which time they were no longer there, nor were any birds seen after that time. Close attention to the birds while they frequented the cliff, however, produced no conclusive evidence of their having bred.

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MOLLUSCA.

Mollusca at Masham.—On the occasion of the visit of the Mycological Section of the Yorkshire Naturalists' Union to Masham, the following mollusca were observed.—The gatherings have been examined by Mr. John W. Taylor, M.Sc.

MASHAM.

<i>Helix aspersa.</i>	<i>Helicigona arbustorum.</i>
<i>Ashfordia granulata.</i>	<i>Limax maximus.</i>
<i>Limax arborum.</i>	<i>Hygromia striolata.</i>
<i>Pyramidula rotundata.</i>	<i>Theba fusca.</i>
<i>Hyalinia helvetica.</i>	

SWINTON.

<i>Planorbis albus.</i>	<i>Planorbis nautilus.</i>
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HACKFALL.

<i>Hyalinia cellaria</i>	<i>Ashfordia granulata.</i>
<i>Conulus fulvus.</i>	<i>Helicigona arbustorum.</i>
<i>Arion hortensis.</i>	<i>Clausilia laminata.</i>
<i>A. circumscriptus.</i>	<i>Zua lubrica.</i>
<i>Limax arborum.</i>	<i>Theba fusca.</i>
<i>Agriolimax agrestis.</i>	<i>Pyramidula rotundata.</i>
<i>Hygromia hispida.</i>	<i>Clausilia bidentata.</i>
<i>H. striolata.</i>	

MARFIELD POND.

<i>Limnæa peregra</i> (fine).	<i>Planorbis marginatus.</i>
<i>L. palustris.</i>	<i>Bythinia tentaculata.</i>
<i>Planorbis corneus.</i>	

EELMIRE, NR. JERVAULX.

<i>Planorbis marginatus.</i>	<i>Limnæa truncatula.</i>
<i>Pl. nautilus</i> and <i>v. imbricata.</i>	<i>Pisidium subtruncatum.</i>
<i>Pl. albus.</i>	<i>P. obtusalis.</i>
<i>Limnæa peregra.</i>	<i>P. pusillum.</i>

RIVER URE.

<i>Ancylus fluviatilis.</i>	<i>Pisidium nitidum.</i>
<i>Pisidium amnicum.</i>	<i>Sphærium corneum.</i>
<i>P. supinum.</i>	<i>Arion subfuscus.</i>
<i>P. casertanum.</i>	<i>A. circumscriptus.</i>

—GREEVZ FYSHER.

YORKSHIRE MYCOLOGISTS AT MASHAM.

A. E. PECK,
Hon. Secretary Mycological Committee.

THE Fungus Foray of 1923 (the 310th Meeting of the Union) was held at Masham from September 1st to September 6th, with Headquarters at the Commercial Hotel.

Members of the Mycological Committee present were Harold Wager, D.Sc., F.R.S. (Chairman), W. N. Cheesman, J.P.; A. Clarke, J. W. H. Johnson, M.Sc.; R. Fowler Jones, F. A. Mason, Thos. Smith, Greevz Fysher, Miss D. Hilary and A. E. Peck (Hon. Secretary).

Other members of the Union and visitors who took part in the proceedings were Rev. C. H. Watson (Vicar), E. Snelgrove, B.A., R. W. Butcher, B.Sc., W. A. Thwaites, S. D. Fisher, W. S. Bisat, Mesdames Fisher, Smith and Bisat, and Master Frank Peck.

Masham is in the valley of the Ure, ten miles from Ripon. It is a picturesque little old market town with traditions of more prosperous days when its cattle markets were important, and its commodious inns were scenes of bustling life. From its streets charming views of the surrounding country are obtained, plentifully dotted with the patches of woodland so well loved by the Mycologist, but far too numerous and extensive to be worked by a little party in one short week of variable weather.

Mr. W. A. Thwaites has resided here for many years, a nature-lover of the best kind.

To Masham, more than twenty years ago, came a party of Yorkshire naturalists (among them the late Chas. Crossland), and from that date Mr. Thwaites has had an added interest in life, for he promptly fell in love with the study for which our old friend was such an enthusiastic advocate.

In the days that followed, Mr. Thwaites collected hundreds of species of fungi and sent them to Crossland and Massee for determination. These records are now embodied in the 'Yorkshire Fungus Flora.' Mr. Thwaites subsequently entertained the late James Needham at Masham, and in 1903 he was present at the Yorkshire Naturalists' Union Fungus Foray at Helmsley.

Of members attending the present Foray, Messrs. Cheesman, Clarke and Wager were at that Foray of twenty years ago.

Mr. Thwaites acted as guide. It was, in fact, upon his invitation and promise of hearty co-operation that the locality had been decided upon for this year's operations.

Members reached Masham on Friday and by Saturday noon numerous specimens from near gathering grounds had been deposited upon the tables at Headquarters, prominent among them being very fine examples of *Lepiota procera*; *Psalliota subgibbosa* was also an early find.

On Sunday, under the leadership of Mr. H. Wheeler, the head gardener, the party was conducted round the extensive and beautiful gardens, conservatories and grounds of Swinton Hall, the seat of Lord Masham.

Under the fir trees many specimens of *Otidea phlebophora* were gathered, the outer side being a rich lemon yellow in colour.

On Monday the party visited parts of the Jervaulx estate of Mr. Christie. In the woods above East Witton, the best finds were *Merulius tremellosus* and *Pleurotus striatulus*, the latter a small dark-coloured dimidiate agaric growing on a fallen branch, and a very inconspicuous object, being gathered by Mr. Butcher, and creating a new record for the county.

On Tuesday, Hackfall was visited. Here the principal feature was the remarkably fine growth and rich colour of the Chantarelle, *Cantharellus cibarius*, which grew in some quantity. Several specimens of

Cordyceps militaris were here observed, growing from their accustomed host, the buried pupæ of insects.

On Wednesday the woods near Swinton Hall were explored. Here, on a bank, by kneeling and scraping among fallen leaves, Mr. Thwaites discovered a number of rather diminutive specimens of *Mitrula viridis*, an Ascomycete of club-shape and dull green colour, rendering it very inconspicuous, and so rarely detected. Returning, within the grounds of the Hall, and by a path side, Master Frank Peck discovered a number of specimens, which proved to be *Lepiota Bucknallii*, an agaric now seen for the first time by most members. It possesses a strong odour of gas tar, a character which enabled the writer to quickly 'run it down.'

A specimen of *Boletus rugosus* well justified its specific name, as did also *Lactarius cemicarius*, with its odour of bugs.

In all 295 species and varieties were found, the subjoined list only recording the more interesting of these. Included it will be seen there are 11 new to the County Flora, whilst 69 are new to North-west Yorks.

It may be added that several other species were now only recorded for the county for the second time. Mr. Cheesman dealt with the Mycetozoa, listing 31 species, of which 4 are new to Yorks N.W.

Miss E. M. Wakefield kindly named some of the resupinate fungi for us. Mr. Clarke has searched the County Records and certifies the additions.

Lectures were given by Dr. Wager, Mr. Cheesman and Mr. Mason. In the Town Hall, with the Vicar in the Chair, the writer gave his Lantern Lecture on 'Edible and Poisonous Mushrooms' to a well-filled room.

At the 'Business Meeting,' Mr. E. Snelgrove, B.A., of Sheffield, was added to the Mycological Committee. In response to an invitation from the Sorby Scientific Society it was decided to meet next year (August 30th-September 4th) in the Sheffield district. Votes of thanks were accorded to landowners for permission to visit their estates, and to Mr. Thwaites for his eminently efficient services as guide. Mr. Thwaites, in responding, spoke of his old association with Crossland, Massee and Needham, and of the great delight which the present visit had afforded him.

AGARICINÆ.

* <i>Amanita spissa</i> Fr.	<i>Lactarius piperatus</i> (Scop.) Fr.
* <i>Lepiota cristata</i> (A. and S.) Fr.	* <i>L. deliciosus</i> (Linn.)
* <i>L. Bucknallii</i> B. & Br.	* <i>L. picinus</i> Fr.
* <i>Tricholoma columbetta</i> Fr.	* <i>L. volemus</i> Fr.
* <i>T. argyraceum</i> (Bull.) Fr.	† <i>L. ichoratus</i> (Batsch.) Fr.
† <i>T. argyraceum</i> var. <i>chrysites</i> Jung.	* <i>L. cemicarius</i> (Batsch).
<i>T. cuneifolium</i> Fr.	<i>Russula chloroides</i> .
* <i>T. ionides</i> (Bull.) Fr.	<i>R. sardonias</i> .
* <i>T. sordidum</i> (Schum.) Fr.	* <i>R. foetens</i> (Pers.) Fr.
* <i>T. grammopodium</i> (Bull.) Fr.	<i>R. subfoetens</i> W.G.S.
† <i>Clitocybe connata</i> (Schum.) Fr.	* <i>R. puellaris</i> Fr.
* <i>Collybia platyphylla</i> (Pers.) Fr.	* <i>Cantharellus cinereus</i> (Pers.) Fr.
* <i>Mycena rubro-marginata</i> Fr.	† <i>C. tubæformis</i> (Bull.), v. <i>lutescens</i>
* <i>M. pura</i> (Pers.) Fr.	Fr.
* <i>Omphalia muralis</i> (Sow.) Fr.	<i>Marasmius hariolorum</i> (D.C.)
* <i>O. fibula</i> var. <i>Swartzii</i> Karst.	Quel.
† <i>Pleurotus striatulus</i> Fr.	<i>Panus conchatus</i> (Bull.) Fr. On
* <i>Hygrophorus Clarkii</i> B. & Br.	dead holly trunk.
* <i>H. turundus</i> Fr., v. <i>mollis</i> B. & Br.	<i>P. torulosus</i> .
* <i>Lactarius insulsus</i> Fr.	<i>Pluteus chrysophæus</i> (Schaeff.) Fr.
* <i>L. pergamenus</i> (Swartz.) Fr.	

* Signifies First Record N.W. Yorks. Vice-County 65).

† Signifies First Yorkshire Record.

- **Entoloma nigrocinnamomeum* Kalchbr.
E. prunuloides.
 **Clitopilus cancrinus* Fr.
Pholiota erebia.
 **P. flammans* Fr.
 **Inocybe pyriodora* (Pers.) Fr.
 **I. rhodiola* (Bres.) Massee.
 **I. fastigiata* (Schaeff.) Fr.
Hebeloma longicaudum.
 **Cortinarius* (Hydro.) *bicolor* Cke.
 **C.* (Tel.) *evernius* Fr.
- **Paxillus giganteus* (Sow.) Fr. =
Clitocybe gigantea Quel.
 **Psalliota campestris* var. *rufescens* Berk.
 **P. villatica* Brond.
 **P. sylvatica* (Schaeff.) Fr.
P. hæmorrhoidaria Kalchbr.
 †*P. subgibbosa* Fr.
 **Psilocybe sarcocephala* Fr.
 **Gomphidius glutinosus* (Schaeff.) Fr.
 **G. viscidus* (Linn.) Fr.

POLYPOREÆ.

- **Boletus variegatus* Swartz.
B. luridus.
B. laricinus.
 †*B. rugosus* Fr.
 **Polyporus melanopus* Fr.
 †*P. ancanthoides* (Bull.) Fr.
 **P. lacteus* Fr.
 **P. cerebrinus* B. & Br.
P. cæsius.
Polyporus chioneus.
P. adustus.
 **P. cuticularis* Fr.
 **Fomes populinus* Fr.
 **F. fraxineus* (Bull.) Fr. on ash.
Polystictus abietinus.
 **Poria vulgaris* Fr.
 †*P. contigua* Fr.
 **Merulius tremellosus* Schrad.

HYDNEÆ.

- **Hydnum auriscalpium* Linn.
Caldesiella crinalis (Fr.) B. & G.
 = *C. ferruginosa* (Fr.) Sacc.
 **Radulum epileucum* B. & Br.
 **R. orbiculare* Fr.
Grandinia farinacea (Pers.) Bourd.
 and Galz.
 **Phlebia merismoides* Fr.
P. radiata.
 †*Odontia sudans* (A. & S.) Bres.
O. arguta (Fr.) Quel.

THELEPHORACEÆ.

- **Craterellus cornucopioides* (Linn.) Pers.
Sebacina calcea (Pers.) Bres.
Hymenochaete tabacina Lev.
 **Thelophora terrestris* Ehrb.
 †*Cladoderris minima* B. & Br.
 (= *Corticium calceum* (Pers.) Fr.)
Stereum rugosum (Pers.) Fr.
Corticium Sambuci (Pers.) Fr.
 **C. lactescens* Berk.
 **Peniophora velutina* (D.C.) Cke.

CLAVARIÆ.

- **Clavaria acuta* Sow.

TREMELLINÆ.

- Tremella foliacea* (Pers.) Fr.

GASTEROMYCETÆ.

- **Bovista plumbea* Pers.
B. pusilla (Fr.) De Toni.
Lycoperdon velatum Vitt.
 **Lycoperdon molle* Pers.
 **L. echinatum* Pers.
 **Scleroderma bovista* Fr.

ASCOMYCETES.

- **Otidea phlebophora* B. & Br.
 **Leotia lubrica* (Scop.) Pers.
 **Mitrula viridis* (Pers.) Karst.
 (= *Mitrula serpentina* (Muell.) Massee.)

HYPHOMYCETES.

- **Rhinotrichum repens* Preuss.

MYCETOZOA.

- **Badhamia panicea* Rost.
 **Physarum viride* Pers. var.
aurantium Lister.
 **Enteridium olivaceum* Ehrb.
 **Tubifera ferruginosa* Gmel.

ADDITIONS TO THE YORKSHIRE DIPTERA LIST.

CHRIS. A. CHEETHAM.

THE following species, in conjunction with those noted in the reports of the Union's excursions this year, will add about seventy species to our list. It would have been scarcely possible to have done this without the kind assistance and advice of Mr. J. E. Collin and Mr. F. W. Edwards, whose initials are placed after the species they have verified. The type collection presented to us by Mr. P. H. Grimshaw has cleared away many difficulties, and we are extremely grateful to these gentlemen for their help.

A.=Austwick. Al.=Allerthorpe. F.=Farnley. P.=Pateley.
C.A.C.=C. A. Cheetham. F.W.E.=F. W. Edwards. J.E.C.=J. E. Collins.

<i>Cordyla crassicornis</i> Mg.	A., 7/1/23.	C.A.C. (F.W.E.)
<i>Mycetophila luctuosa</i> Mg.	A., Oct./22.	" "
<i>Rhymosia cristata</i> Staeg.	P., 22/7/22.	" "
<i>Exechia subulata</i> Winn.	A., 8/10/22.	" "
<i>E. lingulata</i> Lündst.	P., 22/7/22.	" "
<i>E. trisignata</i> Edw. m.s.	A., Oct./22.	" "
<i>Allodia anglo-fennica</i> Edw. m.s.	P., 22/7/22.	" "
<i>A. amæna</i> Winn.	A., 8/10/22.	" "
<i>A. alternans</i> Zett.	A., 8/10/22.	" "
<i>A. digitata</i> Edw. m.s.	P., 22/7/22.	" "
<i>Docosia sciarina</i> (nec Mg.).	A., 8/10/22.	" "
<i>Phronia nitidiventris</i> v.d. W.	A., 7/1/23.	" "
<i>P. flavipes</i> Winn.	A., 8/10/23.	" "
<i>P. tenuis</i> Winn.	A., 8/10/23.	" "
<i>P. rustica</i> Winn.	P., 22/7/22.	" "
<i>Sceptonia concolor</i> Winn.	A., Oct./22.	" "
<i>Zygomyia valida</i> Winn.	A., Oct./22.	" "
<i>Z. pictipennis</i> Staeg.	A., Oct./22.	" "
<i>Z. vara</i> Staeg.	A., Oct./22.	" "
<i>Z. nigracula</i> Wlk.	A., Oct./22.	" "
<i>Leiomyia Winthemi</i> Lehm.	A., 8/10/22.	" "
<i>Neoemphelia pictipennis</i> Hal. (nec Winn.).	P., 22/7/22.	" "
<i>Mycomyia trilineata</i> Zett.	A., Oct./22.	" "
<i>M. hyalinata</i> Mg.	Al., 15/9/23.	" "
<i>Macrocera phalerata</i> Mg.	F., 10/7/22.	" "
<i>Diadocidia ferruginosa</i> Mg.	P., 22/7/22.	" "
<i>Scatopse flavicollis</i> Mg.	A., 15/9/23.	" "
<i>S. scutellata</i> Lw.	Al., 15/9/23.	" "
<i>S. transversalis</i> Lw.	Al., 15/9/23.	" "
<i>Limnobia quadrinotata</i> Mg.	Wistow, 20/8/23.	" "
<i>Molophilus undulatus</i> Tonn.	Masham, 11/8/23.	" "
An addition to the British list, specimen in Brit. Mus.		
<i>Ormosia albitibia</i> Edw.	Al., 15/9/23.	" "
<i>Erioptera minor</i> de Meij.	Nidd, 2/8/21.	" "
<i>Tipula obsoleta</i> Mg. nec L. (<i>alpinum</i> Bergr.).	Whernside, Ingleboro', Pateley, Bishopdale, Cronkley.	" "
<i>T. excisa</i> Schum.	Whernside, 11/8/22; Ingleboro', 7/7/23; Cronkley, 9/8/23.	" "

<i>Tipula luteipennis</i> Mg.	A., 1/9/21.	C.A.C.
<i>T. cava</i> Reidel.	All the insects I have under <i>peliosigma</i> Schum. are this species (Farnley, Skipwith, Austwick, etc.).	
<i>Pachymeria (Empis) palparis</i> Egg.	Whernside, 11/8/22.	„
<i>Hilara fuscipes</i> Fab.	Bishopdale, 6/8/22.	„
<i>H. thoracica</i> Mcq.	P.	„
<i>Psilopus Wiedemanni</i> Flin.	Wistow, 20/8/22.	„
<i>Pipunculus montium</i> Bkr.	Adel.	„ (J.E.C.)
<i>Chilosia honesta</i> Rnd.	Al., 5/6/22.	W. J. Fordham.
<i>C. mutabilis</i> Fall.	Sheffield, 10/8/20.	„
<i>Phryxe (Blepharidiopsis) nemea</i> Mg.	Bred from <i>A. grossulariata</i> by G. T. Porritt, these were recorded as <i>Ex. agnata</i> , but J. E. Collin says they are <i>P. nemea</i> .	
<i>Piophilila varipes</i> Mg.	F., 18/7/22.	C.A.C. (J.E.C.)
<i>P. nigriceps</i> Mg.	F., 27/7/22.	„ „
<i>Diastata fulvifrons</i> Hal.	P., 22/7/22.	„ „
<i>Drosophila phalerata</i> Mg.	F., 4/10/22.	„ „
<i>Chlorops humilis</i> Lw.	Skipwith, 20/8/22.	„ „
<i>Oscinis albiseta</i> Mg.	F., 18/7/22.	„ „
<i>Oscinella frontella</i> Fall.	F., 8/7/22.	„ „
<i>Dicraeus vagans</i> Mg.	F., 27/7/22.	„ „
<i>Agromyza lateralis</i> Mcq.	Wistow, 20/8/22.	„ „
<i>Cerodonta (Ceratomyza) spinicornis</i> Mcq.	F., 3/10/20.	„ „
<i>Phytomyza (Chromatomyia) affinis</i> Mg.	F., 4/10/22.	„ „
<i>Scatella quadrata</i> Fall.	Crag Wood, 22/9/23.	„

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Some Cumberland Mosses.—The mosses here recorded are all new to the Cumberland Flora, at least none is given for V.C. 70 in the Census Catalogue issued by the Moss Exchange Club. Specimens of all have been through the hands of the Rev. C. H. Binstead, or the late Wm. Ingham. *Dicranum scoparium* var. *orthophyllum* Brid., on earth on the side of Carrock Fell. *Fissidens pusillus* Wils., on sandstone blocks in the Newbiggin Woods, near Carlisle, and on rocks beneath the Caves at Weatheral. I have found it fruiting from September to March. *Grimmia apocarpa* var. *alpicola* Hook. and Tayl., on a wall by the side of Ennerdale Lake, which would be under water when the lake is full. *Tortula mutica* Lindb., banks of the River Eden near the Spa Well, on sandy soil about the roots of trees liable to be submerged during floods. *Barbula revoluta* Brid., on the lime in the walls of most of the bridges over the River Petteril, between Wreay and Carlisle. *Heterocladium heteropterum* var. *fallax* Milde, on wet sandstone rocks in a ghyll in Wreay Woods, and among other mosses in a ghyll at the south end of Corney Fell, in South Cumberland. *Plagiothecium elegans* Sull., on sandstone rocks in a ghyll in Wreay Woods. *Amblystegium varium* Lindb., on the wall at St. Ninian's Well at Brisco, near Carlisle. *Sphagnum medium* Limpr., is plentiful on Oulton Moss, near Wigton.—JAS. MURRAY, Kelsick, Wigton.

FIELD NOTES.

BOTANY.

Alchemilla alpina L. in Derbyshire.—*Alchemilla alpina* has not previously been recorded wild in a locality further south than the northern part of the West Riding of Yorkshire. We have found several plants in Pin Dale, near Castleton, which we have had under observation for two successive years, and they seem to be well established. They are at an altitude of 800 to 900 feet, on Carboniferous Limestone. It is not likely that they have escaped from gardens, as they form part of a native limestone association. We have not seen any flowers.—A. BEAUMONT and G. JESSOP, Sheffield.

Asplenium Trichomanes at Greenfield.—One day this autumn, while at Seal Bark, Greenfield, we found a tuft of the Black Spleenwort (*Asplenium Trichomanes*). The plant is not a rare one, but is expressly omitted from the Mersey District in Dr. Lees' 'Flora of West Yorks.' John Whitehead worked the Greenfield district, and sent a marked list to Dr. Lees. Whitehead does not include Greenfield in his list of stations for *A. Trichomanes* in his 'Flora of Ashton-under-Lyne.' Dr. Wood gives 'Greenfield, sparingly' in his 1840 '*Flora Mancuniensis*,' and Richard Buxton mentions 'Seal Bark' in his 'Botanical Guide' of 1859. The station, therefore, is really an old one; but the district is bad to work, and so small a fern is easily overlooked.—FREDK. J. STUBBS, Oldham.

It is worthy of note that the above species still persists in this locality.—T.W.W.

ARCHÆOLOGY.

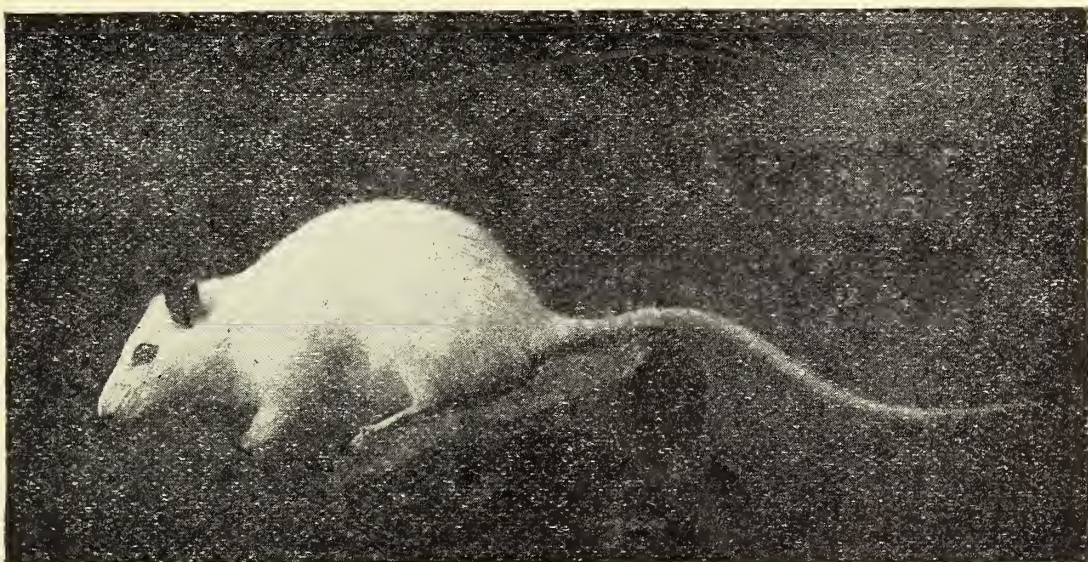
'Witch Stones.'—Referring to the note on page 354, the use of stones with a natural perforation through them (or a bone similarly perforated) is still well known, and not uncommonly practised in many parts of the country. I have 'witch stones,' 'hag stones,' or 'lucky stones,' as they are variously called, from Yorkshire, Durham, Somersetshire, Devonshire, The Channel Islands and Ireland. In the last-named country they are tied to the horns of the cows, and to the boughs of the fruit trees, to prevent the pixies stealing the milk, or the fruit. In other places they are hung in stables to prevent spells of witchcraft being cast over the horses, hung at the head of the bed to keep away nightmare, tied beneath the seat of fishing cobbles to bring good luck to the boat, carried in the pocket, or hung behind the door to keep away witches.—W. J. CLARKE.

MAMMALS.

Red Squirrel in Yorkshire.—I saw a fine Red Squirrel drinking from the waters of the Wharfe, a little above the

Strid, at 8 p.m., on Saturday, June 30th, and a single specimen in Mulgrave Woods, Sandsend, on the 20th August. On Sunday afternoon, October 7th, I was one of fifteen persons who watched for about ten minutes the antics of an old, and a young Red Squirrel, in the wood to the right from the Mansion House, coming to the head of the upper lake in Roundhay Park, Leeds. Between them they demolished a slice of bread thrown by one of us. Two were also seen by me in Cannon Hall Park, Cawthorne, on the 1st July, 1922.—W. E. L. WATTAM. Newsome.

Rare Rats in the Hull Museum.—Among the additions to the collection of mammals recently made to the Natural History Gallery of the Museum at Hull are two white rats and



one fawn or apricot-tinged *Rattus rattus* var. *brookei* (described by Dr. Crew, in Vol. XIV., No. 5, of the *Journal of Heredity* for August, 1923). There is also an adult and three-quarter grown blue *Rattus rattus*, the specific name of which is not yet fixed. The specimen figured herewith is one of the white *Rattus brookei*, which has been mounted by Mr. W. H. L. Whish, of Lympsham, Somerset, to whom we are indebted for the illustration.—T.S.

REPTILIA.

Spanish Gecko in Hull.—One of the three European Geckos, *Hemidactylus turcicus*, a fairly common Mediterranean species, was recently caught alive in Hull, having been imported with fruit from Spain. It has been handed over to the Zoological Society in London, who are glad to have it, as species of this kind are rarely caught alive without being damaged.—T.S.

REVIEWS AND BOOK NOTICES.

Coal and Allied Subjects : A Compendium of the First Ten Bulletins issued by The Lancashire and Cheshire Coal Research Association, by **F. S. Sinnatt**. London : H. F. & G. Witherby, 205 pp., 15/- net. The Lancashire & Cheshire Coal Research Association has issued a number of Bulletins dealing with the sampling of coal, coal dust and fusain, coal analysis, stone dusting of mines, determination of the calorific value of coal, etc., and the present volume contains these bound together as in this form they are more likely to be preserved. The author has had the collaboration of R. A. Burrows, A. Grounds, H. Stern, F. Bayley, M. Barash, W. Harrison, A. McCulloch, May B. Craven.

The Real Story of the Whaler : Whaling, Past and Present, by **A. Hyatt Verrill**. London : Appleton & Co., xv.+295 pp., 10/6 net. This is a fascinating story of the whaling industry, and the author has a thorough acquaintance with the minutest detail of the various and numerous appliances used in the handling of sperm whale, and with the instinct of a collector, has gathered together lists of names of the different parts of the whales, weapons, etc. There are collections of old sea-songs, and illustrations of scrimshawed whale's teeth by whalers; jaggings wheels, and numerous other objects made by the sailors in order to pass their time during the long journeys. The naturalist will find much useful information relating to these southern mammals.

A Text-Book of Ore Dressing, by **S. J. Truscott**. London : Macmillan & Co., xi.+680 pp., 40/- net. Professor Truscott's text-book will doubtless be the standard work dealing with this very complicated subject, for a considerable time to come. He seems to be thoroughly familiar with the methods adopted in various countries, and by the aid of photographs, diagrams, plans and sections, illustrates the different methods of obtaining and preparing various ores and minerals. The work originally was intended to go with a course on Mineral Dressing at the Royal School of Mines, and there can be little doubt that it will answer this purpose admirably. The book bears a somewhat unusual dedication, viz :—' To Almighty God : the Father of our Lord Jesus Christ.'

Inland Birds : Northern Observations by a Sportsman, by **H. Mortimer Batten**. London : Hutchinson & Co., 288 pp., 12/6 net. The author tells us that he does not wish his book to be looked upon as a reference book. He is a well-known writer on ornithological matters, and his chapters are arranged under headings such as : Children of the Sun (Golden Eagle and Buzzard) ; The Dusk and the Starlight (Brown, Barn, Long-eared, Short-eared, Little and Fern Owls) ; Sable Pirates (Raven, Carrion and Hooded Crows) ; Meadow, Stream and Pasture (Pied, Grey and Yellow Wagtails, and Kingfisher) ; and Woodland Thieves and Loafers (Jackdaw, Jay, Magpie), which give an idea of his method of treatment. There are over thirty plates upon which typical species are represented, some in very unusual attitudes. It is perhaps unnecessary to state that in this case the author is thoroughly familiar with his subject and has a pleasant style. We can recommend the book.

Foundations of Biology, by **L. L. Woodruff**. London : Macmillan & Co., xviii.+476 pp. It is of interest to get the opinions of a Professor of Biology in the Yale University on such an important question as that indicated by the title of this work, and it must be admitted that in this particular instance the author has made a much more interesting and readable narrative than is usually the case, while his diagrams and other illustrations, his appendices, bibliography, glossary, etc., are of considerable additional value. In the twenty well written chapters the author deals with ' The Scope of Biology ' ; ' The Physical Basis of Life ' ; ' Organizational Units of Plants and Animals ' ; ' Metabolism of Green Plants ' ; ' Metabolism of Animals ' ; ' Reproduction in Plants ' ; ' The Animal

Body ' ; ' Nutrition in Animals ' ; ' Origin of the Individual ' ; ' Heritage of the Individual,' and numerous other similar topics.

Local Geology : A Guide to Sources of Information, by **A. M. Davies** (16 pp., 1/- net) has been published by T. Murby and Co. Those interested in geology will find much of bibliographical and topographical interest in the address.

Elementary Zoology, by **Oswald H. Latter**. London : Methuen & Co., x.+333 pp., 12/- net. From the publisher's announcement we gather that ' this book covers the syllabus in Zoology prescribed by the University of London and the Northern Universities Joint Board for their respective Matriculation Examinations. It is also intended for use in the upper forms of schools as an introduction to Zoology, *via* natural history. The mode of treatment is based upon the author's experience during more than thirty years as Biology master at Charterhouse.' This explains the nature and scope of the book, and in its twenty chapters we have information on The Structure and Main Functions of the Chief Parts of the Body of a Mammal (Man and Rabbit) ; The Digestive, Respiratory, Circulatory, Excretory and Nervous Systems ; Unicellular Animals ; Metazoa ; Vertebrates ; The Value of Colour in the Animal Kingdom ; Evolution and Heredity, and many other similar subjects. There are over 100 well chosen diagrams and other illustrations, and the price is quite reasonable.

The Investigation of Mind in Animals, by **E. M. Smith**. Cambridge University Press, 6/-. The naturalist of to-day must often find that he is travelling over old ground, for there is scarcely a parish where the birds and beasts have not been subjected to a thorough investigation. Miss Smith's book suggests that if one turns from their habits to their minds, animals offer a fresh field. Indeed, Miss Smith suggests that we practically know nothing about the minds of animals ; in fact, we cannot be certain that they have minds at all. ' To sum up,' says she, ' we may say that it is by no means disproved that animals are intelligent and have ideas—but no test as yet applied completely excludes the possibility that animal learning is anything more than a process of association on the perceptuo-motor level.' Writing as a Christian, and not as a psychologist, I find this book singularly disturbing : for just where one expects the evidence for mind to be conclusive, Miss Smith assures us that mind does not exist ; and where we expect no mind to be, Miss Smith flicks away the curtain, and there mind is. Hitherto, the protozoa have not been considered particularly brainy ; but the author assures us that *Paramecium* can make trials and correct errors ; what is more, his response to significant stimuli is not always the same. In other words, he can attack a problem and solve it—which implies a rudimentary form of mind. On the other hand, the monkey, whom we are inclined to look upon as a clever little devil, is not so clever as he looks. Shepherd worked with eight Rhesus monkeys, and after three week's training, none of them had learned to push out with a plunger a banana wedged in the middle of a glass tube. Nor were Watson's attempts to teach his troupe to use a T-rake to sweep in food placed beyond reach outside the cage, much more successful. So there you are ! But why not make a few experiments on the mind of *Homo sapiens* ? Should we get any better results ? For instance, how many could remember the plot of the film seen the day before yesterday ? How many females of the species could remember the title of the novel read last week ? What reasons, if any, could they adduce for their belief that Mr. X, the politician, is a silly old fool ; or their belief that he is a heaven-endowed genius ? Perhaps we had better keep to the lower animals. As an encouragement, it is possible that one's experiments may bring one immortality at one remove. Hundreds of years hence, scientists may be citing ' Appleton's guinea-pigs ' or ' Shepherd's fleas,' just as we now refer familiarly to Lockhart's elephants.—EDGAR APPLETON.

The Strange Adventures of a Pebble (296 pp., 7/6 net), and **The Adventures of a Grain of Dust** (251 pp., 7/6 net), both by **Hallam Hawksworth**. London: C. Scribner's Sons. In these two volumes the author uses an exceedingly popular style to explain the rocks of America and their formation, as well as the animals and plants which there occur. The articles are particularly well illustrated by diagrams, maps, photographs, etc., and will appeal to young naturalists.

Aberrations of Life, by **J. G. McKerrow**. London: Longmans, Green & Co. (107 pp., 6/- net). We are informed that this book merely attempts to apply the theory set forth in 'The Appearance of Mind' to some of the abnormal phenomena of Life and 'Consciousness.' Its chapters deal with Physiological Abnormalities; Abnormalities of Personality; Dissociation; Mania-Melancholia; Psychic Phenomena; and From Matter to Spirit, but we confess the subject is beyond us.

Messrs. Ward, Lock & Co. have published two of the cheapest and most elaborately illustrated volumes that we have seen for some time, each with a suitable coloured wrapper, namely **The Wonder Book of Animals**, and **The Wonder Book of Nature**, each containing 256 pages (6/- net), and printed in large type. The illustrations, frequently two or three to the page, are in differently tinted inks, in addition to which there are twelve plates in colour from paintings by various artists. The selection of the illustrations is admirable in each case, and we know nothing more likely to please children.

Chronicles of the Free Grammar School of Prince Henry at Otley, by **L. Padgett**. Otley: Walker & Sons, 156 pp., 15/-. Those interested in Yorkshire schools in general, and in the Otley Grammar School in particular, will be grateful to Mr. Padgett and the late Fred Cobley for the pains they have taken in gathering together the chronicles of this fine old foundation dating back to James I. Extracts from the old charters and deeds, with much quaint information relating to the history of the school for three centuries, are carefully recorded, and it must be with mingled feelings that one learns of the closing of the old Grammar School and the erection of a new one in 1909.

Place Names of the Highlands and Islands of Scotland, by **Alex. Macbain**. Stirling: E. Mackay, xxxii.+381 pp., 21/-. This substantial contribution to Philology is divided into sections dealing with the Place Names of Skye, Lochaber, Lochalsh, the Hebrides, Inverness and Vicinity, Inverness-shire, Badenoch, Annat, Gaelic, Glen-shiel, Tomnahurich, Ross and Cromarty, Elginshire and Argyll. The student of Place Names, particularly on the East Coast of Britain, should make a point of carefully perusing the present volume, and while, as the Editor, Dr. W. J. Watson, admits, Dr. MacBain was not always correct in his conclusions, the fact remains that much valuable information is gathered together which, with the aid of an excellent index, will be of considerable service to the worker.

Manual of Entomology, by **H. Maxwell Lefroy**. London: E. Arnold & Co., xvi.+541 pp., 35/- net. At first sight this well-produced and well-printed volume seems to be the 'last word' on the subject, and gives the impression that at last the science of Entomology has received a disciple in the person of Professor Lefroy, who will at once bring the study of insects to the forefront in a way which has not hitherto been the case. The chapters deal with various sections of insect life; they are well illustrated, and throughout every possible attempt is made to indicate the economic importance of a thorough study of insect life in all its phases. In this respect the work will probably do good, but the naturalist, pure and simple, will see much in it with which he hardly agrees. The book, therefore, will appeal less to the naturalist than to the student of agriculture and of crops of various descriptions, though after all it is for this student that the book has been written. The publishers are to be congratulated upon their part of the work.

The late J. R. Boyle made a number of valuable contributions to archæological literature, many of which will stand the test of time. Perhaps one of the best known of these, and certainly one that required an enormous amount of original research, was his **Comprehensive Guide to the County of Durham**, issued in 1892, a work which was anything but a mere compilation from previously existing volumes, as such guides often are. The Walter Scott Publishing Co. has re-issued this work in two forms, one a single volume of 733 pp., the other in two volumes, Vol. I. being entitled **Durham: Its Cathedral and Surroundings**, and Vol. II., **Guide to the County of Durham**, but the paging, etc., is apparently the same as in the larger volume, the difference being that for 2/6 the Guide to the Cathedral or to the county can be obtained separately. Our readers will be interested to know that, in addition to the ordinary guide book information, the volume has a general account of the geology, fauna, and flora, and prehistoric remains of the county. In harmony with the preceding, the same publishers have issued **Comprehensive Guide to Northumberland**, by W. Weaver Tomlinson (xi.+582 pp., 7/6), and the fact that it is a tenth edition is quite sufficient recommendation. Being printed on thin paper the book is not too heavy, and has maps and other helpful information.

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Maud E. Sargent contributes 'Some Fish Names' to *The Animal World*, No. 213.

'Camping Weather' is the title of a paper appropriately signed by A. Frost in *Camping* for November.

B. B. Riviere has a lengthy paper on 'Homing Pigeons and Pigeon-Racing' in *British Birds* for November.

Dr. F. J. North contributes 'Some Methods of Mounting Geological Specimens' to *The Museums Journal* for November.

'Old haunts re-visited—Wicken and the Deal Sandhills,' is the title of a paper by Russell James in *The Entomologist's Record* for October.

Sigurd Johnsen contributed 'Remarks on the Distribution and the Biology of *Myctophum glaciale* (Reinh.) to the *Bergens Musuems Aarbok*, 1921-22, I. Hefte.

The Field for October 11th contains a note by A. P. Coote to the effect that the Green Woodpecker is very common in Mulgrave Woods, Sandsend, Yorks., this year, and that four or five may be seen at one time.

T. Hudson Beare has visited Bridlington recently and found *Bledius dissimilis* there, and states that it had not been recorded since the late Canon Fowler found it there in 1884. Going on to Middlesbrough he found *B. defensus* and *B. pallipes* there (*Entomologist's Monthly Magazine*, November).

In *The Annals and Magazine of Natural History*, No. 67, Prof. McIntosh writes on (1) 'Certain Features in the British Species of *Lepadogaster*'; (2) 'On the Rarity of Abnormality in the Incisors of the Wild Rabbit, and on its Colouration'; (3) 'On the Fragmentary Skull of the Airthrey Whale, etc.' In the same journal, W. S. Bristowe describes 'A British Semi-marine Spider.'

Major A. R. Dwerryhouse has an unusually detailed paper on 'The Glaciation of North-Eastern Ireland,' in the *Quarterly Journal of the Geological Society*, No. 315. It is illustrated by numerous photographs, sketches and maps, the latter showing the directions of Ice Movement at various periods. His researches are based on (1) the roches moutonnées and striated surfaces; (2) the drift-deposits, including erratics; and (3) the various types of dry channels produced by the water draining away from the ice, or overflowing from temporary ice-dammed lakes.

NORTHERN NEWS.

The death, by his own hand, is announced of the Hon. Nathaniel Charles Rothschild, well known for his interest in natural history.

The death is announced of Dr. J. E. Stead, F.R.S., of Redcar, in his seventy-third year. He was one of our greatest metallurgists.

The terns, gulls, phalarope, and similar species of birds are well illustrated and described in Part XIX. of Hutchinson's *Animals of all Countries*.

Under the title of 'The Dagenham Idol,' Mr. A. G. Wright describes a wooden image recently found in Essex, which bears striking resemblance to the early Scandinavian Roos Carr Images now in the Museum at Hull.

At the Leeds University, on October 22nd, by the unanimous vote of the Council of the Leeds Naturalists' Club and Scientific Association, Mr. T. Sheppard, M.Sc., and Dr. T. W. Woodhead, M.Sc., were elected Honorary Life Members of the Association in recognition of their services to Yorkshire Science and to Yorkshire Scientific Societies.

Bulletin of the Bureau of Bio-Technology (No. 10) contains the title page and index of parts 1-8 of this Journal which form the complete volume; in addition to which the following valuable contributions have been printed: 'The Occurrence and Effects of Wood-destroying Fungi in Coal Mines,' by F. A. Mason; 'The Examination of Bacteria in Beer Deposits'; 'Water Softening for Spraying Purposes'; and 'The Suppression of Insect Pests and Fungoid Diseases.'

Besides the usual wealth of archæological and antiquarian notes, *The Journal of the Derbyshire Archæological and Natural History Society*, Vol. XLV., contains some valuable 'Notes on Lepidoptera, 1922,' by H. C. Hayward; and 'Ornithological Notes for Derbyshire, 1922,' by N. H. FitzHerbert. The Society is certainly to be congratulated on the value of the articles appearing in the volume and upon the way it has been produced. The loss of the late Editor, Mr. C. E. B. Bowles, is a serious one to the Society.

We have received from Mr. J. M. Brown a reprint of his paper appearing in *The Annals and Magazine of Natural History* for September, on 'Two New Collembola found in Britain.' The first he describes as *Achorutes strenuus*, sp. n., although he states that 'According to the terminology of some Continental authors, this species should be named *Hypogastrura strenua*, sp. n.' This example occurs on the face of the chalk cliff at Beachy Head and near Eastbourne. The other species, *Isotoma vestita*, sp. n. is from Grindleford, Derbyshire.

As our readers may possibly be aware, there has been no profit on *The Naturalist* either to the Yorkshire Naturalists' Union or to the publishers for some time, and every effort has been made, even at a loss to both parties, to keep the Journal up to its standard. This effort will still continue, but during the present period of high prices for workmanship and materials it is necessary slightly to increase the charge to our subscribers, but we trust this may not be a permanency. Next year the price of *The Naturalist* will be 15/- net to subscribers, or 1/6 net for odd parts. This does not apply to members of the Yorkshire Naturalists' Union.

The Smithsonian Institution is reverting to its old method of issuing the excellent reports on the various ramifications in that enormous concern, supplemented by papers and memoirs of various descriptions of general interest. In the Reports for the Year 1921, recently issued, are the following, among many valuable contributions, with the familiar wealth of illustration: 'The Age of the Earth,' by the Rt. Hon. Lord Rayleigh, W. J. Sollas, J. W. Gregory and G. Jeffreys; 'Breeding Habits, Development and Birth of the Opossum,' by Carl Hartmann; 'The Science of Man: Its needs and its prospects,' by Karl Pearson; 'Ancestor Worship of the Hopi Indians,' by Elihu Grant; and 'A Fifty-year Sketch-history of Medical Entomology,' by L. O. Howard.

CLASSIFIED INDEX.

COMPILED BY W. E. L. WATTAM.

It is not an index in the strictest sense of that term, but it is a classified summary of the contents of the volume, arranged so as to be of assistance to active scientific investigators; the actual titles of papers not always being regarded so much as the essential nature of their contents.

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CORRIGENDA.

- Page 254, line 13, for 'fungorum Dz.' read 'lineola Mg.'
- „ 254, „ 30, for 'Empida' read 'Empeda.'
- „ 254, „ 39, for 'Ephelia marmorata Mg.' read 'Pœcilostola punctata Schr.'
- „ 254, „ 88, for 'acrea' read 'aerea.'
- „ 254, „ 101, for 'Cyloropisca' read 'Chloropisca.'
- „ 260, „ 44, for 'Hydrogen-Iron' read 'Hydrogen-Ion.'
- „ 285, „ 13, for 'Blaacew' read 'Blaauw.'
- „ 286, „ 3, for '(Div. 9.)' read 'For the District.'

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